

# Water Conservation Plan



**City of Fort Worth**

Adopted April 09, 2019

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## APPENDICES

<b>APPENDIX A</b>	<b>List of References</b>
<b>APPENDIX B</b>	<b>Texas Commission on Environmental Quality Rules on Water Conservation Plans for Municipal and Wholesale Water Providers</b> <ul style="list-style-type: none"><li>• Texas Administrative Code Title 30, Part 1, Chapter 288, Subchapter A, Rule §288.1 – Definitions (Page B-1)</li><li>• Texas Administrative Code Title 30, Part 1, Chapter 288, Subchapter A, Rule §288.2 – Water Conservation Plans for Municipal Uses by Public Water Suppliers (Page B-5)</li><li>• Texas Administrative Code Title 30, Part 1, Chapter 288, Subchapter A, Rule §288.5 – Water Conservation Plans for Wholesale Water Suppliers (Page B-9)</li></ul>
<b>APPENDIX C</b>	<b>City of Fort Worth Utility Profiles Based on TCEQ Format</b>
<b>APPENDIX D</b>	<b>Letters to Region C and G Water Planning Groups, and Tarrant Regional Water District</b>
<b>APPENDIX E</b>	<b>Adoption of the Water Conservation Plan</b>

## 1.0 INTRODUCTION AND OBJECTIVE

Water supply has always been a key issue in the development of Texas. In recent years, the increasing population and economic development of North Central Texas have led to growing demands for water supplies. At the same time, local and less expensive sources of water supply are largely already developed. Additional supplies to meet future demands will be expensive and difficult to secure. Severe drought conditions in the recent past have highlighted the importance of the efficient use of our existing supplies to make them last as long as possible. Extending current supplies will delay the need for new supplies, minimize the environmental impacts associated with developing new supplies, and delay the high cost of additional water supply development.

Recognizing the need for efficient use of existing water supplies, the Texas Commission on Environmental Quality (TCEQ) has developed guidelines and requirements governing the development of water conservation plans.<sup>1</sup> The TCEQ guidelines and requirements are included in Appendix B. The City of Fort Worth has developed this Water Conservation Plan in accordance with TCEQ guidelines and requirements. To develop a regional approach, Tarrant Regional Water District's Water Conservation and Drought Contingency Plan<sup>2</sup>, of whom the City of Fort Worth is a customer, was consulted. This Water Conservation Plan replaces the previous plan dated April 2014.

The City of Fort Worth also recognizes that in order to achieve its goals of maximizing water conservation and efficiency, it is necessary to develop and implement a water conservation plan that goes beyond basic compliance with TCEQ guidelines and requirements. This Plan reflects the City of Fort Worth's commitment to enhanced water conservation and efficiency strategies – particularly those best management practices established by the Water Conservation Implementation Task Force<sup>3</sup> and Water Conservation Advisory Council (WCAC), which were incorporated, where practicable, in the development of these water conservation measures. The Water Conservation Implementation Task Force developed the Texas Water Development Board Report 362 Water Conservation Best Management Practices Guide in partial fulfillment of the Texas Legislature's charge to the TCEQ and Texas Water Development Board (TWDB) to develop recommendations for optimum levels of water use efficiency and conservation in the State. In 2007, the state legislature created the WCAC which was given several charges, one of which is monitoring new technologies for possible inclusion in the best management practice guide. The WCAC regularly reviews, updates, and creates new best management practices through a collaborative process.

<sup>1</sup> Superscripted numbers match references listed in Appendix A

As best management practices are developed, they are published online at <http://www.savetexaswater.org/bmp/index.asp>.

The objectives of this Water Conservation Plan are as follows:

- To reduce water consumption from the levels that would prevail without conservation efforts.
- To reduce the loss and waste of water.
- To improve efficiency in the use of water.
- To encourage efficient outdoor water use.
- To document the level of recycling and reuse in the water supply.
- To extend the life of current water supplies by reducing the rate of growth in demand.

The City's plan will achieve significant conservation savings to help extend the life of existing supplies without burdening the customer with unnecessary additional costs.

#### Abbreviations

Abbreviation	Full Nomenclature
AMI	Advanced Metering Infrastructure
AWWA	American Water Works Association
BMP	Best Management Practices
EPA	Environmental Protection Agency
TCEQ	Texas Commission on Environmental Quality
TRWD	Tarrant Regional Water District
TWDB	Texas Water Development Board
WCAC	Water Conservation Advisory Council
WCP or Plan	Water Conservation Plan

## 2.0 REGULATORY BASIS FOR WATER CONSERVATION PLAN

### 2.1 TCEQ RULES GOVERNING CONSERVATION PLANS

The TCEQ rules governing development of water conservation plans for public water suppliers are contained in Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2 of the Texas Administrative Code, which is included in Appendix B. For the purpose of these rules, a water conservation plan is defined as “A strategy or combination of strategies for reducing the volume of water withdrawn from a water supply source, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the recycling and reuse of water, and for preventing the pollution of water.” The elements in the TCEQ water conservation rules covered in this conservation plan are listed below.

#### Minimum Conservation Plan Requirements

The minimum requirements in the Texas Administrative Code for Water Conservation Plans for Public Water Suppliers are covered in this report as follows:

- 288.2(a)(1)(A) – Utility Profiles – Section 3.0 and Appendix C
- 288.2(a)(1)(B) – Record Management System – Section 5.2
- 288.2(a)(1)(C) – Specific, Quantified Goals – Section 4.0
- 288.2(a)(1)(D) – Accurate Metering – Section 5.2
- 288.2(a)(1)(E) – Universal Metering – Section 5.2
- 288.2(a)(1)(F) – Determination and Control of Water Loss – Section 5.2 and 5.3
- 288.2(a)(1)(G) – Public Education and Information Program – Section 6.1
- 288.2(a)(1)(H) – Non-Promotional Water Rate Structure – Section 6.2
- 288.2(a)(1)(I) – Reservoir System Operation Plan – Section 6.3
- 288.2(a)(1)(J) – Means of Implementation and Enforcement – Section 6.4
- 288.2(a)(1)(K) – Coordination with Regional Water Planning Groups – Section 6.6 and Appendix D
- 288.2(c) – Review and Update of Plan – Section 9.0

#### Conservation Additional Requirements (Population over 5,000)

The Texas Administrative Code includes additional requirements for water conservation plans for drinking water supplies serving a population over 5,000:

- 288.2(a)(2)(A) – Leak Detection, Repair, and Water Loss Accounting – Section 5.3
- 288.2(a)(2)(B) – Requirement for Water Conservation Plans by Wholesale Customers – Section 6.5

### Additional Conservation Strategies

The Texas Administrative Code lists additional conservation strategies, which may be adopted by suppliers but are not required. Additional strategies adopted by the City of Fort Worth include the following:

- 288.2(a)(3)(A) – Conservation Oriented Water Rates – Section 6.2
- 288.2(a)(3)(B) – Ordinances, Plumbing Codes or Rules on Water-Conserving Fixtures – Section 7.1
- 288.2(a)(3)(C) – Replacement of Retrofit of Water-Conserving Fixtures – Section 7.1
- 288.2(a)(3)(D) – Reuse and Recycling of Wastewater – Section 7.2
- 288.2(a)(3)(F) – Considerations for Landscape Water Management Regulations – Section 7.3

In addition to being a public water supplier under TCEQ rules, the City of Fort Worth also acts as a wholesale provider to thirty three current and future wholesale customers; thus, the TCEQ water conservation rules for wholesale providers are also addressed.

The TCEQ rules governing development of water conservation plans for wholesale water suppliers are contained in Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.5 of the Texas Administrative Code, which is included in Appendix B. The elements in the TCEQ water conservation rules for wholesale water suppliers addressed in this Water Conservation Plan are listed below.

### Minimum Conservation Plan Requirements for Wholesale Water Suppliers

The minimum requirements in the Texas Administrative Code for water conservation plans for wholesale water suppliers are covered in this Plan as follows:

- 288.5(1)(A) – Description of Service Area – Section 3.0 and Appendix C
- 288.5(1)(B) – Specific, Quantified Goals – Section 4.0
- 288.5(1)(C) – Measure and Account for Water Diverted – Section 5.1
- 288.5(1)(D) – Monitoring and Record Management System – Section 5.2
- 288.5(1)(E) – Program of Metering and Leak Detection and Repair – Section 5.3
- 288.5(1)(F) – Requirement for Water Conservation Plans by Wholesale Customers – Section 6.5
- 288.5(1)(G) – Reservoir System Operation Plan – Section 6.3
- 288.5(1)(H) – Means of Implementation and Enforcement – Section 6.4
- 288.5(1)(I) – Documentation of Coordination with Regional Water Planning Groups – Section 6.6
- 288.5(3) – Review and Update of Plan – Section 9.0

### Additional Conservation Strategies for Wholesale Water Suppliers

The Texas Administrative Code lists additional water conservation strategies that can be adopted by a wholesale supplier but are not required. Additional strategies adopted by the City of Fort Worth include the following:

- 288.5(2)(C) – Program for Reuse and/or Recycling – Section 7.2
- 288.5(2)(D) – Other Measures - Section 6.1 (public education), and Sections 7.3 (landscape water management measures)

## **2.2 GUIDANCE AND METHODOLOGY FOR REPORTING ON WATER CONSERVATION AND WATER USE**

In addition to TCEQ rules regarding water conservation, this Plan also incorporates elements of the Guidance and Methodology for Reporting on Water Conservation and Water Use developed by TWDB and TCEQ, in consultation with the Water Conservation Advisory Council (the “Guidance”).<sup>4</sup> The Guidance was developed in response to a charge by the 82<sup>nd</sup> Texas Legislature to develop water use and calculation methodology and guidance for preparation of water use reports and water conservation plans in accordance with TCEQ rules. The City of Fort Worth has considered elements of the Guidance in preparation of this Plan.

## **2.3 TEXAS WATER DEVELOPMENT BOARD WATER CONSERVATION PLANNING TOOL**

The TWDB has developed a Municipal Water Conservation Planning Tool to be utilized by utilities to evaluate various best management practices. The tool is pre-loaded with data submitted by utilities as part of the water use surveys and has a library of best management practices with water savings and associated cost. The tool was released on December 14, 2018 and was available for the development of this Water Conservation Plan. The City of Fort Worth has utilized the tool in development of the per capita goals in this Plan and for comparing cost and savings. In addition, Fort Worth encourages each of its Wholesale Customers to utilize the tool, to the extent practical, for water conservation planning. The TWDB offered a training workshop on the tool in December 2018, and the tool along with the training video is posted on the TWDB website.

### 3.0 DESCRIPTION OF SERVICE AREA AND UTILITY PROFILE

The City of Fort Worth provides retail water and sewer service to approximately 820,000 residents and wholesale water service to 33 wholesale customers listed below. Service through wholesale customers accounts for approximately 440,000 additional residents. In total, Fort Worth provides water directly or indirectly to nearly 1.3 million people in Tarrant, Denton, Johnson, Parker and Wise counties. **Figure 3-1** shows Fort Worth’s retail water service area. Fort Worth’s current and future wholesale customers include:

- Aledo
- Benbrook
- Bethesda WSC
- Burleson
- Crowley
- DFW Airport
- Dalworthington Gardens
- Edgecliff Village
- Everman
- Forest Hill
- Grand Prairie
- Haltom City
- Haslet
- Hudson Oaks (future)
- Hurst
- Keller
- Kennedale
- Lake Worth
- North Richland Hills
- Northlake
- Richland Hills
- River Oaks
- Roanoke
- Saginaw
- Sansom Park
- Southlake
- Trophy Club MUD #1
- Trinity River Authority (TRA)
- Westlake
- Westover Hills
- Westworth Village
- White Settlement
- Willow Park (future)

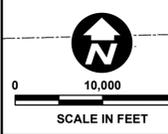
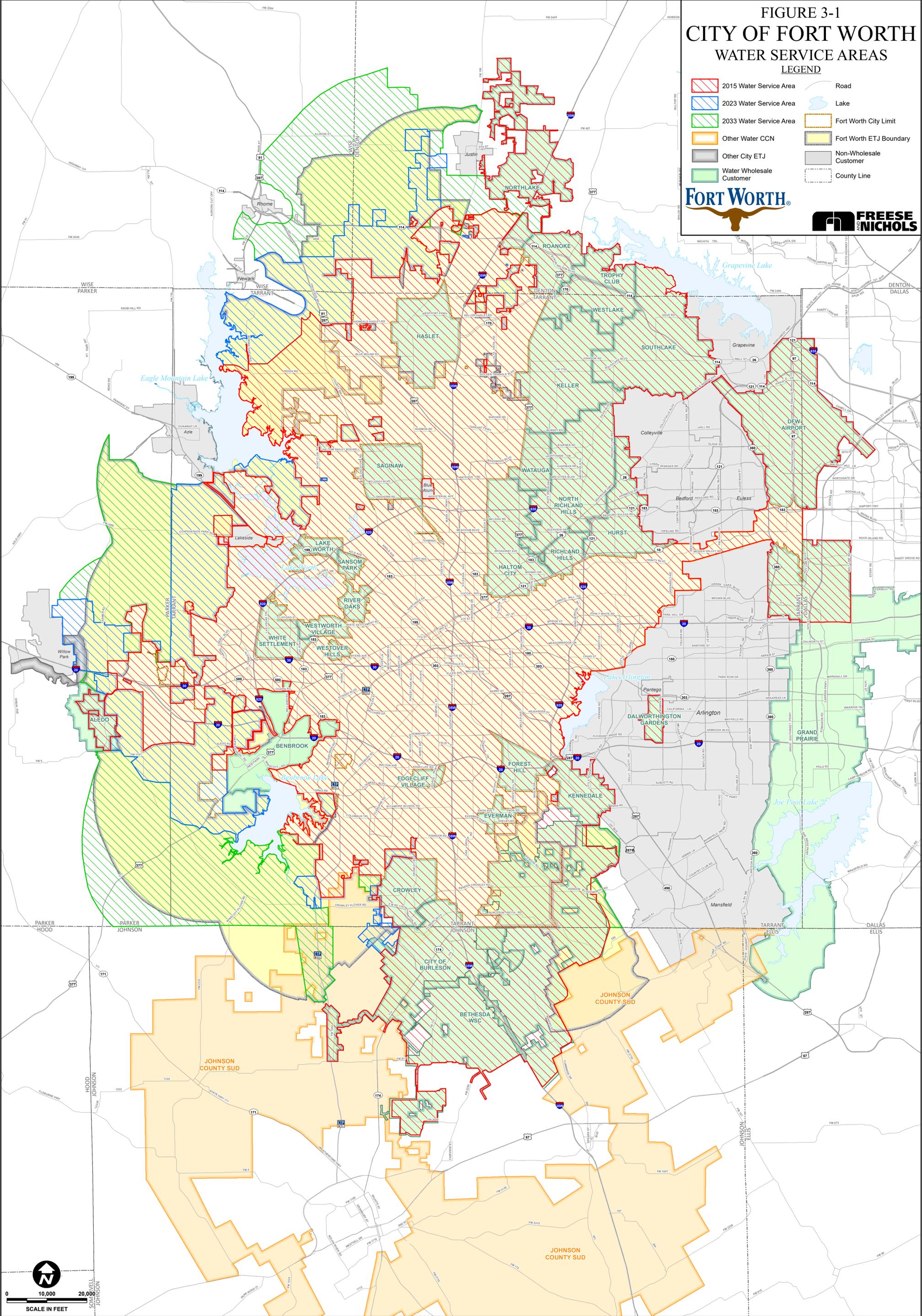
The City purchases raw water from the Tarrant Regional Water District (TRWD). This water is from six major reservoirs, as shown in **Figure 3-2**:

- Lake Bridgeport (via the West Fork of the Trinity River),
- Eagle Mountain Lake (via the West Fork of the Trinity River),
- Lake Worth (via the West Fork of the Trinity River),
- Lake Benbrook (A pipeline connects Lake Benbrook to the Rolling Hills Water Treatment Plant to supplement supply to that plant. A pump station on the Clear Fork of the Trinity River also supplies the Holly Water Treatment Plant.),
- Cedar Creek Reservoir (via pipeline), located approximately 75 miles southeast of Fort Worth, and
- Richland-Chambers Reservoir (via pipeline), located approximately 75 miles southeast of Fort Worth.

# FIGURE 3-1 CITY OF FORT WORTH WATER SERVICE AREAS

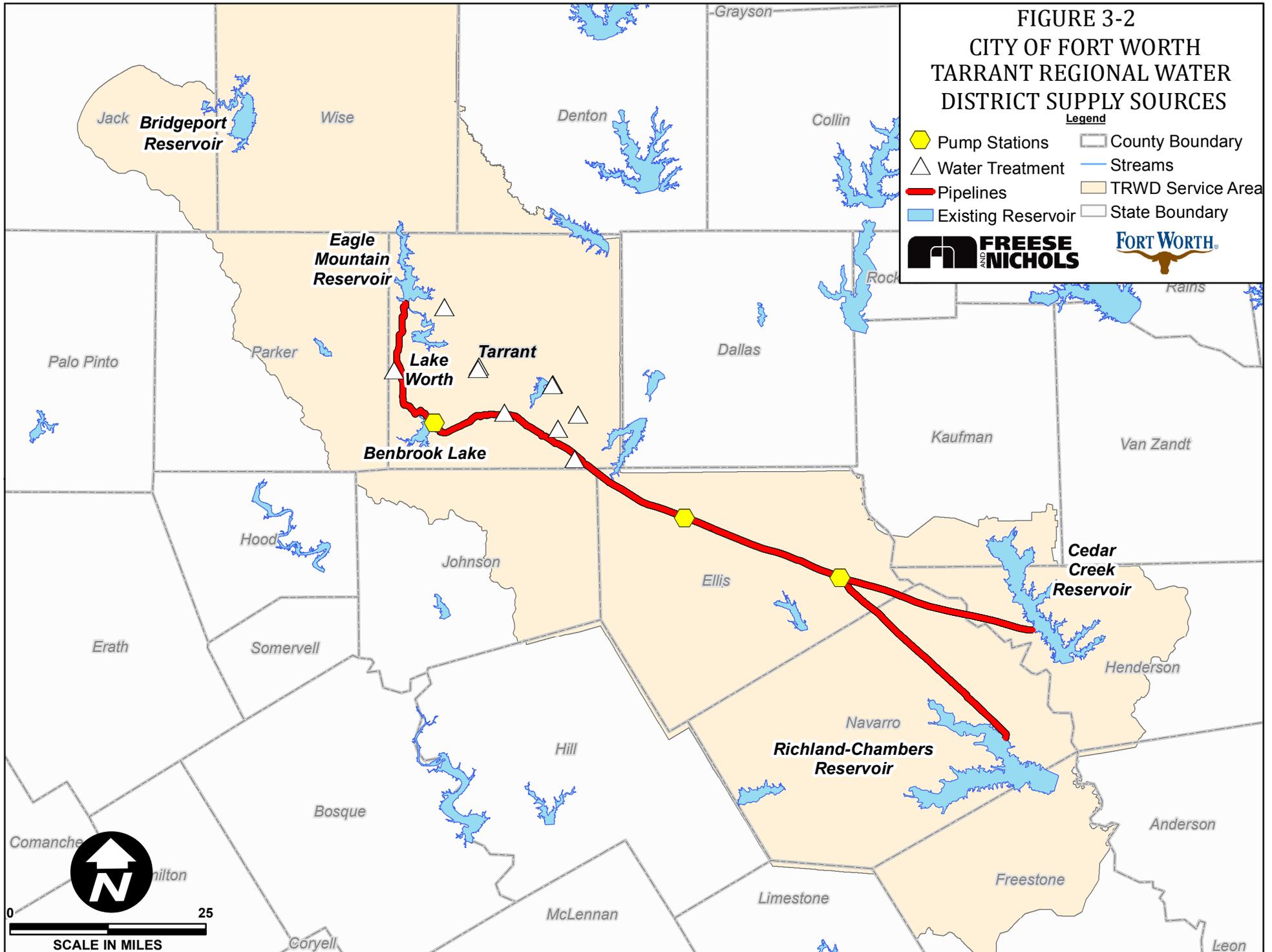
## LEGEND

- 2015 Water Service Area
- 2023 Water Service Area
- 2033 Water Service Area
- Other Water CCN
- Other City ETJ
- Water Wholesale Customer
- Road
- Lake
- Fort Worth City Limit
- Fort Worth ETJ Boundary
- Non-Wholesale Customer
- County Line



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**FIGURE 3-2  
CITY OF FORT WORTH  
TARRANT REGIONAL WATER  
DISTRICT SUPPLY SOURCES**



**Legend**

- Yellow Hexagon: Pump Stations
- White Triangle: Water Treatment
- Red Line: Pipelines
- Blue Area: Existing Reservoir
- Gray Dashed Line: County Boundary
- Blue Line: Streams
- Orange Area: TRWD Service Area
- Black Solid Line: State Boundary

**FREESE AND NICHOLS** **FORT WORTH**

0 25  
SCALE IN MILES

Comanche  
Hilton  
Coryell

The City’s service area is currently served by five water treatment plants. As of 2019, the total treatment capacity is 500 million gallons per day (MGD). A breakdown of treatment capacity by plant is provided in **Table 3-1** below.

**TABLE 3-1: 2019 TREATMENT PLANT CAPACITY**

Treatment Plant	Design Capacity (MGD)	Reliable Pumping Capacity (MGD)
Rolling Hills, est. 1972	200	190
North Holly, est. 1918	80	75
South Holly, est. 1952	100	95
Eagle Mountain, est. 1992	105	100
Westside, est. 2012	15	12
<b>Total</b>	<b>500</b>	<b>472</b>

The City has a wastewater treatment capacity of 166 MGD at the Village Creek Water Reclamation Facility in east Fort Worth.

Appendix C contains Fort Worth’s most recent water utility profiles based on the formats recommended by TCEQ for both retail suppliers and wholesale suppliers.

## 4.0 SPECIFICATION OF WATER CONSERVATION GOALS

TCEQ rules require the adoption of specific water conservation goals for a water conservation plan. The goals for this Water Conservation Plan include the following:

- Maintain the 5-year moving average total per capita and residential per capita water use below specified amount in **Table 4-2**.
- Maintain the level of water loss in the system below the specified amount in **Table 5-3**.
- Maintain the Infrastructure Leakage Index (ILI), as described in Section 5.3, below the specified amount in **Table 5-3**.
- Maintain a program of universal metering and meter replacement and repair as discussed in Section 5.2.
- Increase efficient water usage and decrease waste in lawn irrigation by enforcement of reasonable landscape water management regulations as described in Section 7.3.
- Raise public awareness of water conservation and encourage responsible public behavior by a public education and information program as discussed in Section 6.1.

In the previous (2014) Plan, total per capita use goals were 160 gallons per capita per day (GPCD) by 2020 and 152 GPCD by 2025 as outlined in **Table 4-1** below. Fort Worth’s five-year average per capita use (2013-2017) was 159 GPCD, showing that actual usage has already achieved results in line with the 2014 Plan.

**TABLE 4-1: PREVIOUS PLAN GPCD GOALS (2014)**

Description	Units	2013	2020	2025
Total GPCD <sup>a</sup>	GPCD	171	160	152
Residential GPCD <sup>b</sup>	GPCD	81	76	72

a. Total GPCD = (Total Gallons in System ÷ Permanent Population) ÷ 365

b. Residential GPCD = (Gallons Used for Residential Use ÷ Residential Population) ÷ 365

Going forward, the City has committed to achieving reductions in usage that are substantially more progressive than the 2014 Plan, as shown in **Table 4-2** and **Figure 4-1** below. These goals were calculated by using TWDB’s Municipal Water Conservation Planning Tool (MWCPT), with a combination of pre-defined and user-defined measures. Some measures that the City added to the tool and that showed significant water savings include Year-Round Twice Per Week Watering restrictions, Advanced Metering Infrastructure (AMI), Public Education, School Education, and the City’s Water Efficiency and Condition Assessment Program (WECAP). For more information on how these savings will be achieved by these

programs, see Sections 5, 6, 7 and 8. **Figure 4-1** shows the total annual per capita since 2000, the five-year average and the comparison between the previous goals and current goals.

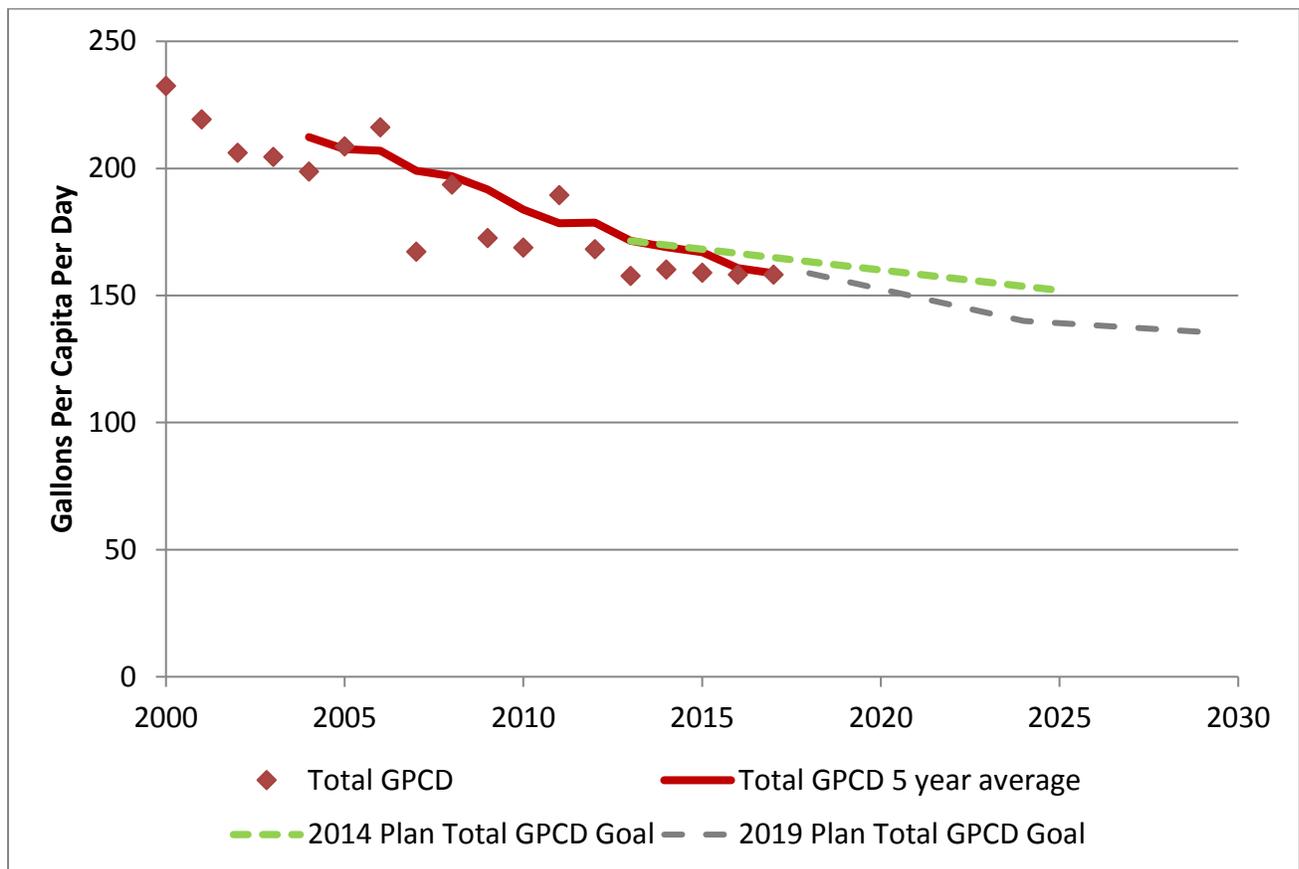
**TABLE 4-2: GPCD GOALS (2019)**

Description	Units	2018	2024	2029
Total GPCD <sup>a</sup>	GPCD	159	140	136
Residential GPCD <sup>b</sup>	GPCD	70	66	58

a. Total GPCD = (Total Gallons in System ÷ Permanent Population) ÷ 365

b. Residential GPCD = (Gallons Used for Residential Use ÷ Residential Population) ÷ 365

**FIGURE 4-1: FORT WORTH TOTAL PER CAPITA USE AND GOALS**



## 4.1 ANALYSIS OF BEST MANAGEMENT PRACTICES

During each update of the Water Conservation Plan the City has evaluated the best management practices outlined in the Water Conservation Best Management Practices Guide<sup>3</sup>. For a complete analysis of the Best Management Practices (BMPs), refer to **Table 4-3** and **Table 4-4** on the following pages. **Table 4-3** looks at the implementation of the BMPs for the practices the City has implemented and the proposed implementation date for additional strategies. **Table 4-4** looks at the potential savings in 2025 and 2030, the proposed cost in 2025 and 2030, the cost per thousand gallons, whether the practice will have an impact to revenues (low, medium or high) and whether the practice has other benefits such as additional supply sources, revenue recovery or education component.

It should also be noted that the Water Conservation Advisory Council (WCAC) is reviewing and updating these BMPs. At this point the WCAC has proposed four BMPs for wholesale water providers and adopted one, Technical Assistance and Outreach, all of which the City is already implementing at some level.

1. Technical Assistance and Outreach – The City holds regular meetings with its wholesale customers to update them on programs the City is implementing. Water conservation staff is available for wholesale customers to contact regarding their programs and to assist wholesale customers with implementing their own programs.
2. Wholesale Conservation Rates – City of Fort Worth structures its wholesale rates such that the utility achieves adequate cost recovery.
3. Water Conservation Education and Public Awareness – The City of Fort Worth has an active water conservation public education program in place. The City coordinates with Tarrant Regional Water District (TRWD) to provide a regionally consistent message on the importance of water conservation and intends to increase involvement throughout the region.
4. Providing Financial Incentives Directly to Customer’s End-Users – Since the City is both a retail and wholesale provider, it has conducted replacement and retrofit programs for retail customers. At this time the City does not intend to offer a collective purchase or direct distribution program for its wholesale customers. While the City does not formally have a cost sharing program with its wholesale customers, the City does participate in the Water Efficiency Network of North Texas that organizes cooperative buying programs across the region.

In 2018, WCAC substantially expanded the number of municipal BMPs that it approves, from 26 to 31. This includes five new BMPs (Customer Characterization, Custom Conservation Rebates, Enforcement of

Texas Irrigation License Standards, Outdoor Watering Standards, Plumbing Assistance Programs for Economically Disadvantaged Customers), and four revised BMPs (Conservation Coordinator, Showerhead, Aerator, and Toilet Flapper Retrofit, Small Utility Outreach and Education, and System Water Audit and Water Loss). As of February 2019, all of these new and revised BMPs are awaiting work sessions and TWDB approval.

**TABLE 4-3: WATER CONSERVATION BEST MANAGEMENT PRACTICES  
IMPLEMENTATION SCHEDULE**

BMP	Description	Implementation Schedule					Notes
		Implementation Date	Implemented By Code	Implemented before 2020	Implemented before 2025	Implemented before 2030	
<b>Municipal BMPs</b>							
2.1	Conservation Coordinator	1990					General duties assigned 1990, program manager hired 2008.
2.2	Cost-Effectiveness Analysis for Municipal Water Users			✓			Developmental work with TWDB tool to determine the cost effectiveness of programs; additionally, City will rely on tool to produce a report with metrics to guide future programs.
2.3	Water Survey for Single-Family and Multi-Family Customers	2007 Irrigation Audits					City to use MyH2O to conduct and review water use for single- and multi-family customers.
3.1	Water Conservation Pricing	1994					Super-user tier removed 2020.
3.2	Wholesale Agency Assistance Programs				✓		City to provide technical assistance on an as needed basis and stakeholder meetings.
4.1	Metering of All New Connections and Retrofit of Existing Connections	Prior to 1980					Implementation of MyH2O starting in 2018 to replace all City meters with digital registers.
4.2	System Water Audit and Water Loss	2002					
5.1	Athletic Field Conservation	2006					Provide outreach and education including an inventory of conservation measures; City to develop communication strategy concerning golf courses, athletic fields and parks.
5.2	Golf Course Conservation				✓		
5.3	Targeted Landscape Irrigation Conservation and Incentives	2003					Comprehensive multi-strategy targeted outdoor program to be developed implementing landscape conversion, retrofits, and public education plan. Participation is voluntary.
5.4	Park Conservation				✓		See comments on 5.1.
5.5	Residential Landscape Irrigation Evaluations	2007					TRWD offers these in the Fort Worth Service Area
6.1	Public Information	1983					
6.2	School Education	1990					Currently partner with other City departments to achieve goal. City to redesign and develop formal education plan.

BMP	Description	Implementation Schedule					Notes
		Implementation Date	Implemented By Code	Implemented before 2020	Implemented before 2025	Implemented before 2030	
6.3	Small Utility Outreach and Education						Fort Worth is not a small utility but will assist their small wholesale customers if requested.
6.4	Partnerships with Nonprofit Organizations	2008					City has worked with Master Gardeners, Botanic Gardens and BRIT; will continue to develop more educational programs.
7.1	Conservation Programs for Industrial, Commercial, and Institutional Accounts	2010					
7.2a	Residential Clothes Washer Incentive Program		1992				
7.2b	Additional Residential Clothes Washer Incentive Programs						Most inefficient residential clothes washers have been replaced
7.3a	Plumbing Code Residential Toilet Replacement Programs		1992/2014				
7.3b	Additional Residential and Commercial Toilet Replacement Programs	2009					Progressively more restrictive
7.4a	Plumbing Code Showerhead, Aerator and Toilet Flapper Retrofit		1992/2014				
7.4b	Additional Showerhead, Aerator and Toilet Flapper Retrofit Program	2018					Showerheads currently distributed to commercial facilities and at promotional events.
7.5	Water Wise Landscape Design and Conversion Programs				✓		
8.1	New Construction Graywater					✓	Addressed in plumbing provisions
8.2	Rainwater Harvesting and Condensate Reuse					✓	Addressed in plumbing provisions
8.3	Water Reuse	1999					
9.1	Prohibition on Wasting Water	1994					

BMP	Description	Implementation Schedule					Notes
		Implementation Date	Implemented By Code	Implemented before 2020	Implemented before 2025	Implemented before 2030	
9.2	Conservation Ordinance Planning and Development				✓		
<b>Draft Municipal BMPs</b>							
	Customer Characterization	2019					City began limited customer characterization in 2019 but will continue an internal review through MyH2O
	Outdoor Watering Schedule	2014					
	Plumbing Assistance Programs for Economically Disadvantaged Customers			✓			
<b>Wholesale BMPs</b>							
2.1	Customer Contract Requirement to Develop and Implement Water Conservation Plans and Drought Contingency Plans	2009					
2.2	Technical Assistance and Outreach	2014					
<b>Draft Wholesale BMPs</b>							
3.1	Cost-Share Program						Fort Worth provides retrofits for retail customers and does not intend to offer cost sharing or direct distribution for wholesale customer
3.2	Wholesale Water Provider's Collective Purchase and Direct Distribution of Water Conservation Equipment						
	Wholesale Conservation Rates						

**TABLE 4-4: BEST MANAGEMENT PRACTICE COST-EFFECTIVENESS ESTIMATES**

BMP Number	Description	Estimates of Current Costs and Savings						Rank for Expenditure	Potential Impact to Water Revenues	Other Benefits Achieved
		Estimated Savings		Estimated Costs		Cost Per Thousand Gallons				
		2024 (MGD)	2029 (MGD)	2024 (\$ per Year)	2029 (\$ per Year)	2024	2029			
<b>Plumbing Code</b>										
7.4a	Showerhead, Aerator and Toilet Flapper Plumbing Code	0.00	0.00	\$0	\$0	N/A	N/A	PL Code	Low	No
7.3a	Residential Toilet Plumbing Code	0.00	0.00	\$0	\$0	N/A	N/A	PL Code	High	No
7.2a	Residential Clothes Washer Plumbing Code	0.00	0.00	\$0	\$0	N/A	N/A	PL Code	High	No
<b>Necessary Programs - No Associated Savings</b>										
2.2	Wholesale Agency Assistance Programs	0.00	0.00	\$50,000	\$50,000	N/A	N/A		High	Yes
2.1	Conservation Coordinator	0.00	0.00	\$95,000	\$100,000	N/A	N/A		Medium	Yes
<b>Programs Not recommended (RWPG)</b>										
8.2	Rainwater Harvesting and Condensate Reuse	0.00	0.00	\$0	\$0	N/A	N/A		Low	No
8.1	New Construction Graywater BMP	0.00	0.00	\$0	\$0	N/A	N/A		Medium-High	No
<b>Cost for Existing and Additional Programs</b>										
9.2	Conservation Ordinance Planning and Development	1.00	2.00	\$70,000	\$80,000	\$0.19	\$0.11	1	Low	No
	Outdoor Watering Schedule (Twice Per Week)	2.64	2.64	\$200,000	\$200,000	\$0.21	\$0.21	2	High	Yes
3.1	Water Conservation Pricing	0.56	0.97	\$70,000	\$80,000	\$0.34	\$0.23	3	Medium	No
9.1	Prohibition on Wasting Water	0.50	0.50	\$70,000	\$80,000	\$0.38	\$0.44	4	Medium	No
6.1	Public Information	0.01	0.01	\$2,200	\$2,200	\$0.55	\$0.55	5	Low	Yes
7.4b	Showerhead, Aerator and Toilet Flapper Retrofit	0.01	0.01	\$5,000	\$5,000	\$0.74	\$0.74	6	Low	No

BMP Number	Description	Estimates of Current Costs and Savings						Rank for Expenditure	Potential Impact to Water Revenues	Other Benefits Achieved
		Estimated Savings		Estimated Costs		Cost Per Thousand Gallons				
		2024 (MGD)	2029 (MGD)	2024 (\$ per Year)	2029 (\$ per Year)	2024	2029			
4.2	System Water Audit and Water Loss (Leak Detection Repair)	3.00	5.00	\$880,000	\$968,000	\$0.80	\$0.53	7	Low	Yes
	Intensified Water Loss and Water Line Replacement Program	4.50	6.00	\$1,320,000	\$1,452,000	\$0.80	\$0.66	7	Low	Yes
7.3b	Residential Toilet Replacement Programs	0.12	0.22	\$135,600	\$135,600	\$1.05	\$1.05	9	Medium	No
6.2	School Education	0.01	0.01	\$3,200	\$3,200	\$1.10	\$1.10	10	Low	Yes
5.4	Park Conservation	0.50	0.50	\$250,000	\$250,000	\$1.37	\$1.37	11	Low	No
5.2	Golf Course Conservation	0.50	0.50	\$250,000	\$250,000	\$1.37	\$1.37	11	Low	No
5.1	Athletic Field Conservation	0.80	0.80	\$400,000	\$400,000	\$1.37	\$1.37	11	Low	No
7.1	Conservation Programs for Industrial, Commercial and Institutional Accounts	0.22	0.24	\$250,000	\$275,000	\$1.64	\$1.64	14	Low	No
8.3	Water Reuse	30.15	30.15	\$20,000,000	\$20,000,000	\$1.82	\$1.82	15	Low	Yes
7.5	Water Wise Landscape Irrigation Conservation and Incentives	N/A	N/A	N/A	N/A	\$1.99	\$1.99	16	Low	No
5.3	Landscape Irrigation Conservation and Incentives	0.03	0.06	\$37,800	\$37,800	\$2.13	\$2.13	17	Medium	No
4.1	Metering of all New Connections and Retrofit of Existing Connections	0.50	0.50	\$500,000	\$500,000	\$2.74	\$2.74	18	Low	Yes
5.5	Residential Landscape Irrigation Evaluations	0.01	0.01	N/A	N/A	\$2.83	\$2.83	19	Low	No
8.2	Rainwater Harvesting and Condensate Reuse	0.01	0.02	\$32,000	\$32,000	\$3.42	\$3.42	20	Low	No

BMP Number	Description	Estimates of Current Costs and Savings						Rank for Expenditure	Potential Impact to Water Revenues	Other Benefits Achieved
		Estimated Savings		Estimated Costs		Cost Per Thousand Gallons				
		2024 (MGD)	2029 (MGD)	2024 (\$ per Year)	2029 (\$ per Year)	2024	2029			
7.2b	Residential Clothes Washer	N/A	N/A	N/A	N/A	\$3.70	\$3.70	21	High	No

Based on 2016 Region C Water Plan, TWDB Municipal Water Conservation Planning Tool, savings and cost data from City of Fort Worth or published literature

## **5.0 METERING, WATER USE RECORDS, CONTROL OF NONREVENUE WATER, AND LEAK DETECTION AND REPAIR**

One of the key elements in water conservation is careful tracking of water use and control of losses. Reducing nonrevenue water is also one of the few conservation programs that directly impacts rates. Programs for universal metering, meter testing, meter repair, and periodic meter replacement have been developed using American Water Works Association (AWWA) standards and are important elements in the City of Fort Worth's program to control losses.

### **5.1 PRACTICES TO MEASURE AND ACCOUNT FOR THE AMOUNT OF WATER DIVERTED FROM TRWD**

Water deliveries from TRWD are metered by TRWD using meters with accuracy of at least  $\pm 5\%$ . TRWD can access the meters at all reasonable times, and meters are calibrated to maintain the required accuracy.

### **5.2 MONITORING AND RECORD MANAGEMENT PROGRAM FOR DETERMINING DELIVERIES, SALES AND LOSSES**

The City has an effective record management system in place. As required by TAC Title 30, Part 1, Chapter 288, Subchapter A, Rule 288.2 (a)(2)(B), Fort Worth's record management system allows for the separation of water sales and uses into residential, commercial, municipal, and industrial categories. This information is included in the TCEQ required Water Conservation Implementation report, as described in Section 6.4.

The City of Fort Worth meters all of the connections in the distribution system. Meters range in size from 3/4" to 10". The meter size distribution is included in **Table 5-1** below. All meters met AWWA accuracy standards when installed. In 2018, there were a total of 261,366 active retail customer meters in the City.

**TABLE 5-1: METER SIZE DISTRIBUTION**

Meter Size	Total Number
5/8" X 3/4"	220,133
3/4" X 3/4"	1,757
1"	25,967
1 1/2"	4,350
2"	7,752
3"	433
4"	430
6"	326
8"	110
10"	27
Unidentified	81
Total	261,366

The City has implemented a meter exchange program that provides for the annual replacement of meters in the system that do not register the correct amount of water flowing through them. This program replaced more than 20,000 meters between 2014 and 2018. The implementation of the meter replacement program is aligned with the deployment of the Advanced Metering Infrastructure (AMI), MyH2O program, further described in Section 7.5.

### 5.3 LEAK DETECTION, REPAIR AND WATER LOSS ACCOUNTING

The system water audit is used annually to monitor the total level of non-revenue water. There are many variables which influence the revenue and nonrevenue components of the City’s water system including meter inaccuracy, data discrepancies, unauthorized consumption, reported breaks and leaks and unreported losses.

The City of Fort Worth uses gallons per connection per day as its preferred water loss metric as it is less variable than other metrics to climatic conditions. In the previous plan, water loss (gallons per connection per day) was 76 with a goal of 72.5 by 2020 and 70 by 2025 (**Table 5-2**). Due to the City’s water loss reduction program, as of 2017, the City has reduced it to 76 gallons of water loss per connection per day (**Table 5-3**).

The Texas Water Development Board has also asked that cities begin to include their water loss in gallons per capita per day and as a percentage of the total water use in the system. In addition to water loss per connection, these are performance indicators that can be used to determine the effectiveness of the water loss reduction program. The City will continue to reduce water losses throughout the system by analyzing and updating the targets and goals of this section annually in conjunction with the water audit.

**TABLE 5-2: PREVIOUS PLAN WATER LOSS GOALS (2014)**

Description	Units	2012	2020	2025
Water Loss GPCD <sup>a</sup>	GPCD	27	25	23
Water Loss Percentage <sup>b</sup>	%	13%	12%	10%
Real Water Loss Per Connection	Gallons/connection per day	76	72.5	70
Real losses	ILI	4.08	3.75	3.5

**TABLE 5-3: WATER LOSS GOALS (2019)**

Description	Units	2017	2025	2030
Water Loss GPCD <sup>a</sup>	GPCD	27	25	23
Water Loss Percentage <sup>b</sup>	%	18%	12%	12%
Real Water Loss Per Connection	Gallons/connection per day	76	72.5	70
Real losses	ILI	4.78	3.75	3.5

a. Water Loss GPCD = (Total Water Loss ÷ Permanent Population) ÷ 365

b. Water Loss Percentage = (Total Water Loss ÷ Total Gallons in System) x 100; or (Water Loss GPCD ÷ Total GPCD) x 100

The Infrastructure Leakage Index (ILI) is a calculation of the theoretical lowest leakage possible divided by existing calculated leakage. This is developed as a unique value for every city and includes variables such as the distance from the curb stop to the meter boxes, the pressure in the system, and the number of service lines or connections per mile of main. Within Fort Worth for the year 2017, the Unavoidable Annual Real Losses (UARL) was approximately 3.9 million gallons per day. This is the theoretical lowest leakage currently possible with the existing infrastructure and service connection density. In 2017, Fort Worth had an ILI of approximately 4.78, which means that theoretically the leakage could be reduced 4.78 times before reaching the lowest possible value. This puts Fort Worth in the average zone of ILIs within the United States. ILI is a good performance indicator for benchmarking the performance of a utilities in operational management of real losses. Generally, an ILI less than 3.0 is considered an extremely efficient system and the goals in this Plan are designed to reach this level over an extended period.

The City will continue to reduce leaks in the system through its state-of-the-art technologies that employ acoustic leak-noise detectors to target and locate suspected leaks. Its leak detection program includes continuously monitoring almost 230,000 linear feet of pipe in critical areas, as well as a goal of surveying over 1.5 million linear feet annually. **Table 5-4** below summarizes the leak detection program activity over the past five fiscal years. In FY19, a Leak Detection Plan is being developed and implemented, to improve leak detection through risk-based survey targeting, continuous monitoring technology and deployment improvements, and laying the groundwork for the implementation and use of District Metered Areas.

**TABLE 5-4: LEAK DETECTION PROGRAM IMPLEMENTATION**

	<b>Leaks Found</b>	<b>Water Saved (MG)</b>	<b>Million Linear Feet Surveyed</b>
FY14	40	55.4	1.4
FY15	45	61.9	1.6
FY16	65	25.8	1.8
FY17	104	91.4	1.6
FY18	49	45.2	1.3

The City is evaluating emerging technologies to analyze data from multiple sources, include SCADA, in order to detect and flag events in water distribution systems, including unobserved leaks and breaks.

The City of Fort Worth’s Water Efficiency Condition Assessment Program (WECAP) is a proactive approach that utilizes a support decision-making tool for identifying and prioritizing inspection, rehabilitation and renewal strategies for raw water transmission and water distribution pipelines. One of the goals of the Program is to provide an objective approach to water system renewal. Water lines were evaluated using a risk-based assessment approach. Risk was calculated as a product of a line’s likelihood of failure (condition) and its consequence if the failure were to occur (criticality). Every water distribution system line asset in the City’s geographic information system (GIS) was scored based on the following parameters:

**TABLE 5-5: WECAP RISK-BASED ASSESSMENT SCORING PARAMETERS**

<b>Condition Parameters</b>	<b>Criticality Parameters</b>
Pipe Material	Ease of Access
Pipe Age	Proximity to Critical Customers
Pipe Work Order History	Number of Customers Served
Pipe Modeled Pressures	Available Resiliency

The results of the risk-based assessment provided the City with the location of its highest risk assets prioritized for system renewal. The program also identifies lines which are in need of renewal not just because of overall risk score, but to prioritize other initiatives as well. Some of these initiatives include:

- Replacements of lines with multiple breaks/leaks from the work order system,
- Renewal/relocation of active distribution system lines from alleyways,
- Replacement of all cast iron pipes in the distribution system, and
- Renewal of small diameter lines to the City’s standard sizing.

The WECAP program developed this prioritized process and enables the City to re-score the lines on a regular interval basis for maintaining an updated program. Another component of the program is to develop an inspection plan for identifying large diameter lines for field testing. This portion of the project

is currently on-going. As the City actively renews older portions of the distribution system/ problematic lines and implements the MyH2O program, water losses should decrease in the coming years. More information on Fort Worth's MyH2O and AMI program can be found in Section 7.5.

## 6.0 OTHER REQUIRED CONSERVATION MEASURES

### 6.1 PUBLIC EDUCATION AND INFORMATION

The City of Fort Worth has an active, comprehensive water conservation public education program in place. The City coordinates with Tarrant Regional Water District (TRWD) to provide a regionally consistent message on the importance of water conservation.

Water conservation staff have implemented the following public education activities in 2017.

- Nearly 8,000 brochures distributed in 2017.
- Nearly 3 million water bill inserts distributed in 2017.
- Notification of local organizations, schools, and civic groups that the City of Fort Worth staff is available to make presentations on the importance of water conservation and ways to save water. In 2017, the City participated in dozens of community events, YardSmart Seminars, and provided support for displays, exhibits and presentations in the community on water conservation reaching nearly 20,000 people.
- Water conservation information on Fort Worth's website ([fortworthtexas.gov](http://fortworthtexas.gov), [savefortworthwater.org](http://savefortworthwater.org)).
- Encouragement of local media coverage of water conservation issues and the importance of water conservation.
- Education programs not only for schools within the Fort Worth Independent School District, but also for schools within the 13 other districts which operate within the wholesale customer boundaries.
- Educational posts on social media accounts.
- Involvement in EPA's fix-a-leak week including the Annual Chasing Leaks 5k.

Fort Worth has been a proactive partner in the EPA's WaterSense program and have been recognized multiple times for their partnership.

- **2018 – WaterSense Promotional Partner of the Year** - The City of Fort Worth expanded its water conservation outreach efforts through collaboration with other WaterSense partners during 2017. Fort Worth Water volunteered to partner with WaterSense on a Fix a Leak Week 2017 Hispanic outreach pilot program. The pilot program consisted of culturally-relevant outreach materials focused on finding and fixing leaks. The materials were modeled after Lotería, a Mexican

game of chance played like bingo, with Fort Worth providing translations for the cards. More than 400 water conservation kits (using bags donated by American Standard) were distributed at various pop-up events throughout the community. The City continued its sponsorship of the third annual Chasing Leaks 5k race, in conjunction with the Fort Worth Runners Club, where more than 180 runners and other attendees received water conservation tips and the new bilingual materials. The City of Fort Worth attended many other community events throughout 2017, including a water festival for fifth graders called Waterama.

- **2017 - WaterSense Excellence in Promoting WaterSense Labeled Products** - The City of Fort Worth Water Department promotes WaterSense labeled products to properties big and small. The department's SmartFlush Toilet Program, which focuses on residential, low-income, elderly and commercial properties, distributed more than 2,800 free WaterSense labeled, dual-flush toilets to Fort Worth residents in 2016. The water conservation staff also began using a geographic information system (GIS) to target properties to receive free WaterSense labeled toilets for replacement based on the age of buildings that might have older toilets installed. To reach Fort Worth's commercial customers, the department provided free facility water evaluations through its SmartWater Industrial, Commercial, and Institutional (ICI) Assessment Program. Department staff identified water-saving opportunities and made recommendations projected to save more than 11 million gallons of water, based on WaterSense's suggested best management practices for commercial and institutional facilities.
- **2016 – WaterSense Excellence in Education and Outreach Award Winner** - The City of Fort Worth earned an Excellence Award for Education and Outreach in 2015 for events that reached a range of audiences. During Fix a Leak Week 2015, Fort Worth partnered with a local running club to host its first 5- kilometer "Chasing Leaks, Fixing Flappers" running race. Several area WaterSense partners and EPA helped with outreach before and during the event. The event included educational activities and demonstrations explaining to the 150 racers and other visitors how to find and fix leaks and showing how much water a leaking toilet can waste in a week. Another effort targeting toilets is the city's SmartFlush Toilet Program, through which more than 4,000 WaterSense labeled toilets were distributed to residential and commercial customers.

## 6.2 WATER RATE STRUCTURE

The City of Fort Worth has conservation-oriented water rate structures in place. The City's current rate structure consists of the following six classes:

- Residential
- Commercial
- Industrial
- Super User (phased out after 2019)
- Irrigation
- Gas Well Use

Each customer is first charged a flat rate based on meter size as outlined in **Table 6-1**. Usage charges are then assessed according to customer class as show in **Table 6-2** to **Table 6-7**. The rate structures for all customer classes are designed to encourage water conservation, and an increasing block rate structure is in place for residential and irrigation classes to reduce peak usage. The City analyzes each customer class and sets rates in proportion to those classes which place the most demands upon the water system. The rates shown in the tables below were effective as of January 1, 2018 and are subject to change as the City continues to refine its rate structures to improve the impact on water conservation and manage the cost of service most effectively.

**TABLE 6-1: MONTHLY METER CHARGES**

Meter Size	Service Charge (Inside City Limits)	Service Charge (Outside City Limits)
5/8" X 3/4"	\$12.10	\$15.13
3/4" X 3/4"	\$12.35	\$15.44
1"	\$25.55	\$31.94
1 1/2"	\$48.00	\$60.00
2"	\$75.00	\$93.75
3"	\$198.40	\$248.00
4"	\$339.80	\$424.75
6"	\$721.45	\$901.81
8"	\$1,260.20	\$1,575.25
10"	\$1,888.75	\$2,360.94

**TABLE 6-2: RESIDENTIAL WATER RATES**

Monthly Volume	Inside City Limits	Outside City Limits
First 6 CCF	\$2.12 per CCF	\$2.65 per CCF
6 CCF to 18 CCF	\$2.97 per CCF	\$3.71 per CCF
18 CCF to 30 CCF	\$3.79 per CCF	\$4.74 per CCF
Above 30 CCF	\$4.56 per CCF	\$5.70 per CCF

Note: 1 CCF (hundred cubic feet) = 748.05 gallons

**TABLE 6-3: COMMERCIAL WATER RATES**

	Inside City Limits	Outside City Limits
All volumes	\$2.54 per CCF	\$3.18 per CCF

**TABLE 6-4: INDUSTRIAL WATER RATES**

	Inside City Limits	Outside City Limits
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All volumes	\$2.50 per CCF	\$3.13 per CCF
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**TABLE 6-5: SUPER USER WATER RATES (PHASED OUT AFTER 2019)**

	Inside City Limits	Outside City Limits
All volumes	\$2.48 per CCF	\$3.10 per CCF

**TABLE 6-6: IRRIGATION WATER RATES**

Monthly Volume	Inside City Limits	Outside City Limits
First 50 CCF	\$2.99 per CCF	\$3.74 per CCF
50 to 100 CCF	\$3.40 per CCF	\$4.25 per CCF
Above 100 CCF	\$4.25 per CCF	\$5.31 per CCF

**TABLE 6-7: GAS WELL RATES**

	Inside City Limits	Outside City Limits
All volumes	\$5.85 per CCF	\$7.31 per CCF

### 6.3 RESERVOIR SYSTEM OPERATION

Fort Worth is a raw water customer of Tarrant Regional Water District (TRWD). As such, TRWD is responsible for operation of their reservoir system which consists of seven major reservoirs – Lake Bridgeport, Eagle Mountain Lake, Lake Worth, Cedar Creek Reservoir, Richland-Chambers Reservoir, Lake Arlington and Lake Benbrook. TRWD’s reservoir system operation plan seeks to maximize efficiency of water withdraws within the constraints of existing water rights. Other priorities include maintaining water quality and minimizing potential impacts on recreational users, fish, and wildlife. Each reservoir is operated on a policy of flood release above the conservation elevation. TRWD coordinates its Operation Plan with all of its water customers and provides recommendations for the operations of regional treatment systems including the City of Fort Worth. For more information regarding TRWD’s Reservoir System Operation please refer to TRWD’s Water Conservation Plan.

### 6.4 IMPLEMENTATION AND ENFORCEMENT

The City of Fort Worth completes the TCEQ required Water Conservation Implementation Report<sup>5</sup> by May 1 of each year. The report includes various water conservation strategies that have been implemented, including the date of implementation. Additionally, the report includes progress made on the five and ten year per capita water use goals from this Plan. If the goals are not being met, Fort Worth must document why not. The amount of water saved is also documented in this report.

## 6.5 REQUIREMENT FOR WATER CONSERVATION PLANS BY WHOLESALE CUSTOMERS

The wholesale service area includes 33 customers. In 2017 there were estimated to be approximately 440,000 people within the combined wholesale customer service area. **Table 6-8** shows each wholesale customer, the amount of water purchased from the City in 2017, and whether they are also a wastewater customer.

**TABLE 6-8: WHOLESALE CUSTOMERS**

Wholesale Customer	2017 Usage (MG)	Wastewater Customer
Aledo	124.5	No
Bethesda WSC	1,012.9	Yes
Benbrook	0.0	No
Burleson	1,678.0	Yes
Crowley	662.1	Yes
DFW Airport	329.6	No
Dalworthington Gardens	99.5	No
Edgecliff Village	154.7	Yes
Everman	0.0	Yes
Forest Hill	394.2	Yes
Grand Prairie	689.8	No
Haltom City	1,594.1	Yes
Haslet	192.2	No
Hudson Oaks (future)	0	No
Hurst	1,893.5	Yes
Keller	2,957.7	No
Kennedale	63.1	Yes
Lake Worth	203.6	Yes
North Richland Hills	2,127.6	Yes
Northlake	103.2	Yes
Richland Hills	264.2	Yes
River Oaks	0.0	Yes
Roanoke	566.6	No
Saginaw	1,028.0	Yes
Sansom Park	0.0	Yes
Southlake	3,256.0	No
Trophy Club MUD #1	764.7	No
Trinity River Authority (TRA)	0.0	Yes
Westlake	450.2	No
Westover Hills	194.9	Yes
Westworth Village	111.3	Yes
White Settlement	487.3	Yes
Willow Park (future)	0	No
<b>Total</b>	<b>21,404</b>	

Each of the City’s wholesale customers is contractually obliged to develop, implement, and update Water Conservation Plans or conservation measures using the applicable requirements of TCEQ Water Conservation Plans, Drought Contingency Plans, Guidelines and Requirements, Texas Administrative Code 30 TAC Chapter 288(a)(2)(C). Each of the City’s wholesale customers are also contractually obligated to adopt any mandatory measures in this plan such as time of day restrictions and the year-round twice per week watering schedule. The City has sent a copy of its Water Conservation and Drought Contingency plans to each of its wholesale customers to aid with the development of their plans.

The conservation goals as outlined in this section of the Water Conservation Plan are intended as guides for the wholesale customers. When existing contracts are renewed and new contracts are signed, requirements for implementation of water conservation plans will be incorporated into the respective wholesale customer contracts.

The City expects each wholesale customer to voluntarily reduce its water use through conservation practices. The targets in **Table 6-9** below are recommended for each wholesale customer. The City encourages each wholesale customer to implement conservation plans which reduce water use within 10% of the target goals.

**TABLE 6-9: WHOLESALE CUSTOMER TARGETS**

	Total GPCD	Residential GPCD	Water Loss Per Connection Per Day
By 2024	135	85	105*
By 2029	129	80	100*

*\* Nonrevenue water targets are based on the new AWWA water audit practices which approve the performance indicator for water losses as gallons lost per connection per day. This includes real and apparent losses. The commonly used percentage is not recommended as it is too variable depending on usage. These are guidelines and are related to the average wholesale customer in a year of average rainfall. These are voluntary guidelines.*

The City requests that each wholesale customer provide a copy of their Water Conservation Plan and required water system audit (as required by the Texas Water Development Board water audit reporting requirement as specified by House Bill 3338) to the City of Fort Worth. This will be required in any new contracts developed with wholesale customers as specified in 30 TAC Chapter 288.

In 2000 the City of Fort Worth’s Wholesale customers accounted for slightly over a quarter of the raw water pumped. In 2017 the wholesale customers accounted for approximately a third of the raw water pumped. As needed, Fort Worth will hold meetings with their wholesale customers to provide information

on Fort Worth's program and conservation best management practices. Additionally, Fort Worth holds meetings with the conservation staff of TRWD to facilitate collaboration and align messaging.

## **6.6 COORDINATION WITH REGIONAL WATER PLANNING GROUPS**

The City has been working with the local Regional Water Planning Groups (Region C and G) to help develop the water conservation plan documents. This Water Conservation Plan has been discussed with Regional Water Planning Group consultants and is consistent with their methodology and structure. Letters documenting that a copy of the Water Conservation Plan was sent to the Chairs of the Region C and G Water Planning Groups are attached in Appendix D.

## 7.0 ADDITIONAL CONSERVATION EFFORTS

### 7.1 WATER-CONSERVING PLUMBING FIXTURES

The City of Fort Worth adopted the 2015 International Plumbing Code, with the following language to be consistent with the 1.28 gallon toilet requirement of the Texas Health and Safety Code, Title 5, Subtitle B, Chapter 372 effective January 1, 2014.

*\*IPC Section 604.4. 1; added to read as follows:*

**604.4.1 State maximum flow rate.** Where the State mandated maximum flow rate is more restrictive than those of this section, the State flow rate shall take precedence.

The 2015 International Plumbing Code was formally adopted by the City Council and included in the Code of Ordinances. This code encourages water conservation through the requirement that all toilets sold, offered for sale or distributed must be a dual flush toilet that may not exceed 1.28 gallons per flush on average or for one full flush. The projected demands for Fort Worth that will be included in the *2021 Region C Water Plan* will account for the new plumbing code requirement. The City routinely inspects new construction, remodeling, add-ons, etc., through building permits to ensure installation of fixtures adheres to current codes.

The City has several programs to encourage the replacement of high water use fixtures, the SmartFlush voucher program and SmartFlush commercial program. The City also has the CARE program for low income and elderly customers for toilet replacement. Since 2009 these programs combined to distribute nearly 45,000 toilets.

### 7.2 REUSE

The City of Fort Worth currently has a direct reuse program in place at its Village Creek Water Reclamation Facility which supplies reuse water to Dallas-Fort Worth Airport, Arlington and Euless. The reuse program is a component of the City's vision to manage its water resources in the most efficient manner.

TRWD has a Texas water right allowing the diversion of return flows of treated wastewater from the Trinity River. The water will be pumped from the river into constructed wetlands for treatment and then pumped into Richland-Chambers Reservoir and Cedar Creek Reservoir. The wetlands project will ultimately provide 115,500 acre-feet per year, of which 10,000 acre-feet per year can be supplied from existing facilities. A portion of this indirect reuse is provided to the City of Fort Worth.

### 7.3 LANDSCAPE WATER MANAGEMENT

The City has an existing ordinance which prohibits wasting water. This ordinance prohibits watering between 10 a.m. and 6 p.m. year-round. In addition, the Irrigation Ordinance requires that only licensed irrigators alter existing or install new irrigation systems within Fort Worth. The City has adopted ordinances to require rain and freeze sensors on new irrigation systems. The City is piloting a program of irrigations to controllers with the intent to evaluate effectiveness. Based on the results of this pilot program the City may incentivize or encourage certain irrigation controllers.

The City and other regional water providers (North Texas Municipal Water District, Tarrant Regional Water District, Upper Trinity Regional Water District, and the City of Dallas) have collaborated and agreed upon implementing a year-round no more than twice per week watering schedule although not all their wholesale customers have adopted mandatory schedules. The City has a mandatory year-round twice per week water schedule similar to Stage 1 of its drought plan. The schedule is included as **Table 7-1**. Water savings from a year-round no more than twice per week watering schedule vary depending on climate and enforcement, and are expected to be lower outside of drought periods. With the implementation of the MyH2O, staff will be able to identify potential non-compliance with the watering schedule and may utilize this data for education and enforcement.

**TABLE 7-1: YEAR-ROUND TWICE PER WEEK WATERING SCHEDULE**

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
No outdoor watering	Non-residential	Residential addresses ending in (0,2,4,6,8)	Residential addresses ending in (1,3,5,7,9)	Non-residential	Residential addresses ending in (0,2,4,6,8)	Residential addresses ending in (1,3,5,7,9)

### 7.4 CONSERVATION PROGRAMS FOR INDUSTRIAL, COMMERCIAL, AND INSTITUTIONAL ACCOUNTS

The City contracts with a vendor to offer comprehensive audits to these customers. These audits generally consist of a review of the current water use for the customer, their processes, and an audit of their irrigation system (if applicable). All of the analysis from the report is then summarized into a report detailing recommended improvements, the cost, savings and return on investment. Based on analysis performed by the vendor prior to 2014, the program can account for savings of approximately 65-80 million gallons annually at an approximate cost of \$2.35 per thousand gallons. The City has subsequently contracted with Alan Plummer Associates, Inc., who was tasked with reviewing all of the audits associated

with the Smart Water ICI Program, and evaluating their potential water savings. Between Fiscal Year 2011 and 2017, Alan Plummer found that an average of 36 audits were performed each year, resulting in estimated average savings of approximately 55 million gallons per year.

In 2007, the City commissioned a 10-Year Water Conservation Master Plan, which recommended several ICI programs, including cooling tower retrofits and pre-rinse spray valve retrofit. That 2007 plan assisted the City in implementing those two programs and dozens of others.

## 7.5 ADVANCED METERING INFRASTRUCTURE

Advanced Metering Infrastructure (AMI) is generally comprised of:

- Equipment that enables meters to be read remotely rather than physically,
- A communications network that delivers the meter data to a database, and
- Software systems to receive and store the data, providing staff the ability to view and analyze the data and bill customers for their usage.

AMI technology has been the standard at electric utilities for many years. Until recently, the limitation for water utilities has been the source of power. New battery technology with extended service life and smaller size is enabling water utilities to move forward with AMI programs and reap the benefits of leveraging granular water consumption data. Additional benefits of AMI include greater ability to:

- Respond faster to indications of leaks or main breaks,
- Operate with greater efficiency and transparency, and
- Add customer services that are delivered in digital platforms in addition to (or instead of) the existing paper and telephone platforms.

When used to its full capability, AMI has the potential to change the way customers and water utilities interact, how they see water consumption data, understand their water use and act on it. Many cities have begun to test these systems through pilot programs. Like Fort Worth, some cities are changing their business processes to reframing its perspective of data acquisition and leverage the use of the data that will be available through AMI, and moving forward to implement programs that maximize the benefits of AMI.

While AMI is much more than a meter replacement program, most water utilities start by replacing their meters. The physical components are easier to understand and can help ease a utility into the change management process. Installation of AMI-ready meters began in Fort Worth in 2016 at new construction locations or when an existing meter needed replacing. Many of those are large meters, 3-inches to 10-inches, and used mostly at industrial and commercial properties. The business case estimated switching the large meters would result in a 15 percent increase in revenue. Preliminary analysis of affected accounts confirms this.

The AMI system is capable of providing near-real-time hourly water data that can be used to identify leaks or other anomalies in water use. The water utility could use this data to compare the amount of water treated, pumped and delivered to the amount purchased, helping to pinpoint system defects or other sources of nonrevenue water loss.

AMI water meters can alert the system when they have been tampered with or when the battery fails, potentially reducing apparent water loss and unbilled consumption.

Fort Worth is designing its MyH2O AMI systems to provide a valuable education component where a customer could view a “portal” of their previous, current, and projected water use, offering web-based video tools and conservation tips. The portal features proposed will allow customers to manage multiple accounts on one screen.

There are costs associated with AMI systems, primarily in the capital cost to convert to these systems, as well as the operations and maintenance (O&M) costs to manage the data they provide, and the software systems licenses and support required. City staff has identified and been approved of State Water Implementation Fund for Texas (SWIFT) financing for Fort Worth’s MyH2O Program. The program is designed to be delivered to all of the utility’s 260,000-plus accounts in multiple phases over the next few years. For Fort Worth, the proposed changes in the way meter reads are delivered is creating a ripple effect in business process changes. After a careful review of more than 35 business processes impacted by MyH2O and a systems design for the integration, Fort Worth staff is working on a limited deployment to test processes, integrations and communication network, to start the summer of 2019.

The City of Fort Worth is poised to realize the many benefits of AMI in a multitude of sectors, including:

- Reducing apparent water loss,
- Reducing real water loss,

- Advancing water conservation,
- Improving operational efficiencies for meter reading and field investigations,
- Streamlining asset condition assessments,
- Improving the customers' experience,
- Leveraging the use of data, and
- Enhancing transparency.

### Business Model

Converting to AMI can positively impact a utility's business model. Fort Worth's operating efficiencies and benefits range from improving financial forecasting, enabling data-driven decisions such as right sizing water mains, prioritizing water main replacement or recognizing when an aging water meter needs to be replaced to reducing truck rolls, improving employee safety by reducing claims and injuries, and reducing the number of customer calls. The benefits of enhancing the customer experience and providing new additional services to industrial, commercial and institutional customers will enhance the utility's business model and benefit the relationship between the customer and the utility.

Fort Worth projected the Return on Investment (ROI) prior to committing to the SWIFT financing. The project is expected to pay for itself in less than 7 years. Water meters typically fail by underreporting usage, which contributes to a utility's apparent loss. Fort Worth is replacing all retail water meters system-wide (approximately 260,000 accounts), and this is expected to reduce the amount of apparent water loss and real water loss. Operating efficiencies contribute to the ROI by reducing the number of customer calls and field investigations through increased self-serve portal usage and improved work order management system streamlining field activities.

### Water Conservation

Using the data acquired through an AMI system supports water conservation by offering customers the ability to view hourly water usage online. This helps to connect behaviors with the usage and the monthly bill. Equipping customers with more granular data and enhancing online conservation programs is expected to result in a decrease in per capita demand.

Using the acquired data, the utility can better manage water by identifying and responding to system defects sooner. Data comparisons and analysis of produced water versus purchased water can help pinpoint water losses that may occur in the City's distribution system. Analysis of trends in an account's water consumption may indicate a meter needs to be replaced.

### Customer Service

Customer service is the primary interface between the customer and the utility and therefore is critical for the implementation of new and existing programs. Fort Worth values its level of customer service and was recently recognized by J.D. Powers<sup>6</sup> as the highest in the nation in communications. For its MyH2O Program, Fort Worth interviewed a sampling of retail and commercial/industrial customers to gain insight into what enhancements they would embrace. All customers expressed a concern for the elderly who may not be digitally connected, and Fort Worth continues to serve customers through paper billing, offering optional e-bill registration for customers that want to reduce paper. The features planned for the portal are geared for self-service payments, water usage data retrieval, and conservation education. Services that are planned to be phased in may include online account set up and scheduling appointments for field services.

As already mentioned, one of the many benefits to the customer is the ability to monitor their usage through a web portal, and to receive alerts about leaks and/or high use thresholds. Additionally, manual meter reading typically has meter reading cycles between 28 and 35 days. This results in a hypothetical situation where customers' usage between reads over 35 days can be higher than they are used to and can put them in a higher, more expensive tiered rate. AMI eliminates this problem, since AMI meters can be read at consistent intervals.

### Data Security

Customers are increasingly concerned with the security of their personal data. In Fort Worth, data will be encrypted before it is sent through a secure network on a dedicated frequency. Only the meter reading with a system identification code is transmitted. No customer information is accessible or communicated through the data network.

#### 7.5.1 Fort Worth Water's MyH2O

Leadership at Fort Worth embraces the many benefits that AMI can bring and is in the process of deploying a robust program that captures all of those many benefits. Specific benefits that Fort Worth is seeking to realize include:

- Improving the customer experience,
- Advancing water conservation,
- Streamlining business processes,
- Enhancing transparency,
- Leveraging the use of data, and
- Reducing water loss.

Fort Worth Water has taken advantage of SWIFT funding to finance the program. This partnership fulfills TWDB's commitment to furthering conservation in Texas by using 20% of SWIFT funds for conservation projects<sup>7</sup>. The successful implementation of Fort Worth's AMI program will put them among the few cities of its size to do so and will contribute to the state water plan's expectation of municipal water conservation providing 19 percent of the 2060 municipal water supply needs. As part of Fort Worth's long-standing tradition of engaging the community, MyH2O has been developed to inform stakeholders of any developments within the AMI program, and to solicit feedback about the deployment.

Fort Worth is implementing its MyH2O Program in multiple phases over several years:

- Phase 1: Planning, Systems Design, and Acquisition of Network Equipment
- Phase 2: Initial Deployment
- Phases 3 & 4: City-Wide Deployment
- Phase 5: Clean-Up and Close-Out

## **7.6 ADDITIONAL PRACTICES, METHODS, AND TECHNIQUES**

### **7.6.1 Internal City Water Conservation Effort**

The City has implemented water conservation measures internally within City Hall and at a number of its other buildings and parks and will continue to do so over the next five-year planning period. This includes retrofits of toilets, faucets, and showerheads, and development of a landscape program in conjunction

with the Parks and Community Services Department. The City will also continue to analyze water savings from these measures. The City will also promote demonstration gardens such as the Water Conservation Garden at the Fort Worth Botanic Gardens.

#### 7.6.2 Graywater

Residential graywater use (i.e., recycling water within the home using a dual plumbing system) is another potential water supply. The Texas Administrative Code Chapter 210 has rules governing the use of graywater for domestic purposes, industrial, commercial or institutional purposes and irrigation. At this time this practice is not considered economically feasible on a large residential scale, however it may be evaluated on a case-by-case basis for other customer classes. Rules are in place in the City's adopted plumbing code and used on a limited basis.

#### 7.6.3 Rainwater Harvesting and Condensate Reuse

Rainwater harvesting and condensate reuse provide a potential source of supply that could be used for non-potable purposes such as landscape irrigation. Large properties with this potential supply could offset a portion of their irrigation demand depending on the storage capacity. Rainwater and condensate reuse should be evaluated on a case-by-case basis to determine if it is cost effective for large properties. At this time the City will not implement a rebate/giveaway program, but the City will continue to educate the public about the possibility of rain water harvesting and direct them to classes such as the Master Gardeners.

#### 7.6.4 Weather Stations

TRWD has developed an interactive weather station program to install weather stations throughout its service area to provide consumers with a weekly e-mail and information through a website in determining an adequate amount of supplemental water that is needed to maintain healthy grass in specific locations. This service will provide the public advanced information regarding outdoor irrigation needs, thereby reducing water use. Through a series of selections on the type of irrigation system a consumer has, a weekly email that will tell the customer how long (in minutes) an irrigation system needs to run based on the past seven days of weather. This recommendation provides the actual amount of supplemental water that is required for a healthy lawn based on research of the Texas A&M Agrilife Extension Service and proven technologies. Fort Worth will promote this program, encourage its retail and wholesale customers to participate in the program, and make the information available through its website. As of February 2019, over 1,000 Fort Worth residents had signed up for this program.

#### 7.6.5 GIS tools

GIS is a powerful analysis tool to analyze data with a spatial component. Conservation staff will begin working with GIS staff in the water department to build a database for water conservation (including program participation, water use, violations etc.). The GIS tools available could be as simple as identifying target areas for retrofit program based on the Tarrant County Appraisal District data, to as detailed as tying water use to each individual parcel within the City. **Figure 7-1** shows the year built of homes within the Fort Worth city limits. Those areas shaded in purple represent homes that were built prior to 1990 and potentially to have older high use plumbing fixtures. Areas shaded in orange were built between 1990-2000, while those shaded in red were built after 2000.

As the amount of data continues to increase and with the possibility of Advanced Metering Infrastructure, GIS is a potential tool to manage the data and identify where water conservation, leak detection and meter replacement programs should be targeted to achieve the greatest savings.



## 8.0 POTENTIAL FUTURE CONSERVATION PROGRAMS

### 8.1 CUSTOMER CHARACTERIZATION

One of the newer BMPs proposed by the Water Conservation Advisory Council (WCAC) is Customer Characterization, which is the practice of analyzing a utility's customer data trends towards the purpose of realizing targeted water savings. Undertaking a Customer Characterization allows the utility to better understand how water is used within its service area, to recognize the differences between various subjects within its customer base, and to facilitate positive experiences between the utility and the customer that inform both parties of their respective values and familiarize high water users with ways to reduce their usage.

Just as the motivations for deploying an AMI program will be different across utilities, each utility's purpose for embarking on Customer Characterization will be different, and the analysis should be crafted with their specific goal(s) in mind. Customer Characterization is one of the most effective tools for tailoring a utility-wide conservation program, because it yields actionable insight and stimulates community conversation. For instance, if a utility's strategic plan calls for delaying the construction of a new wastewater treatment plant, then that utility would want to formulate the analysis to identify and connect with older homes with higher winter (indoor) water usage patterns. If a utility's goal is to reduce/maintain peak demand during hot and dry periods, then its analysis should focus on identifying and connecting with customers with higher summer consumption and/or whose attributes indicate a proclivity for higher summer consumption. Finally, if a utility is concerned about total growth in annual demand, its Customer Characterization process should be structured around identifying and connecting with customers displaying the largest increase in annual usage. While the first scenario would use housing age data, the second and third scenarios could take into account a number of different datasets for comparison, including but not limited to customer class, home size, meter size, home value, lot size, and zip code/Census tract/Traffic Analysis Zone.

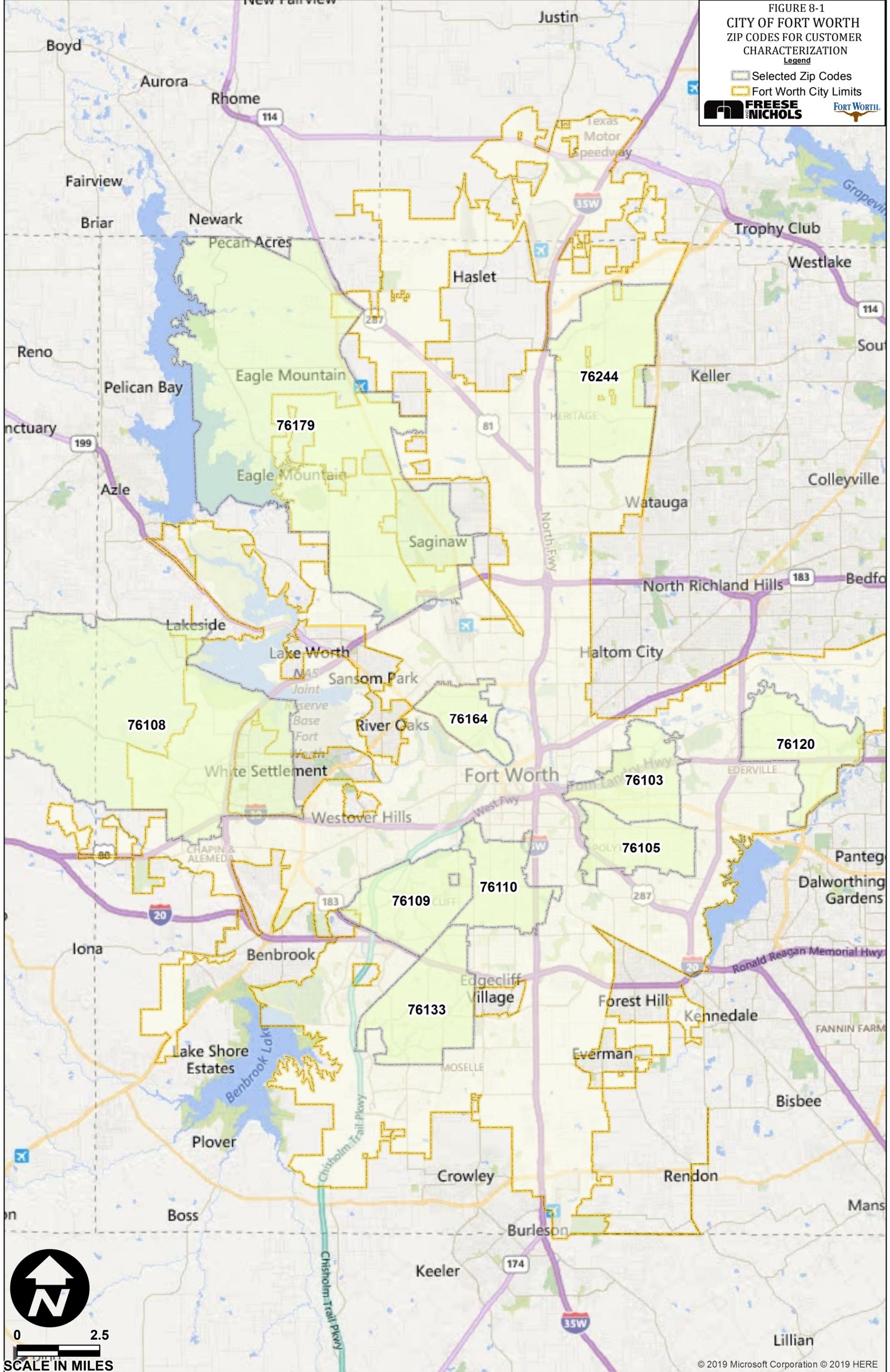
City of Fort Worth and Freese and Nichols (FNI) have completed a preliminary Customer Characterization as a part of this Water Conservation Plan, for the purpose of assisting the utility in evaluating its current and future BMPs. The team started by collecting water usage and meter size data for all single family residential accounts within ten diverse and representative zip codes in the City of Fort Worth (**Figure 8-1**). Account holders' names were removed from all datasets. The next step was preparing the data, by removing accounts with anomalous or incomplete data, and formatting it to be uniform and useful. This

resulted in a final count of more than 80,000 individual single-family residential accounts within the ten zip codes over the period of 2016-2018. Once the data was thoroughly prepared in a manner to allow for flexible and robust analysis, the team conferred to ensure that the analysis would be conducted with the appropriate goal in mind. Since the City of Fort Worth was interested in understanding peak demand patterns, FNI tailored the analysis to focus on monthly versus annual usage. City of Fort Worth was also interested in whether home value correlated with median monthly usage per account. The results of that analysis are shown below in **Figure 8-2** through **Figure 8-5**.

FIGURE 8-1  
 CITY OF FORT WORTH  
 ZIP CODES FOR CUSTOMER  
 CHARACTERIZATION

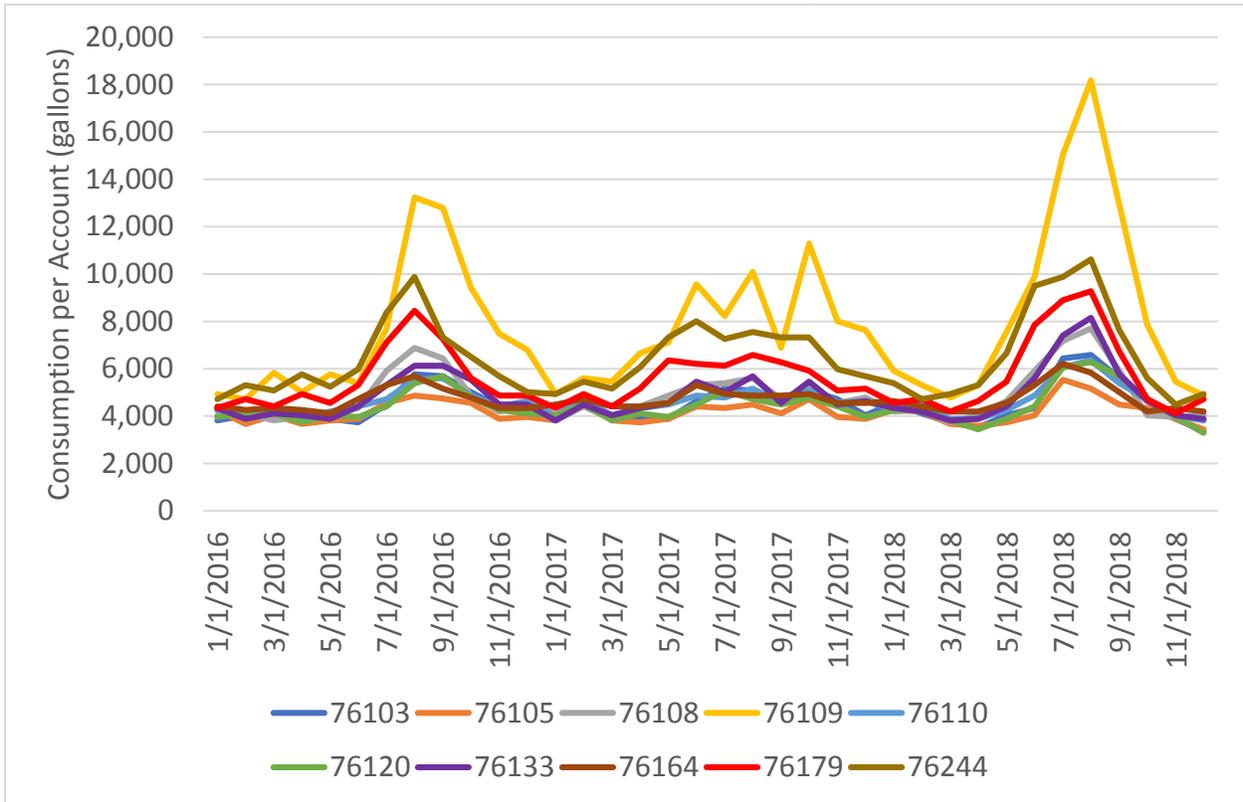
Legend

- Selected Zip Codes
- Fort Worth City Limits

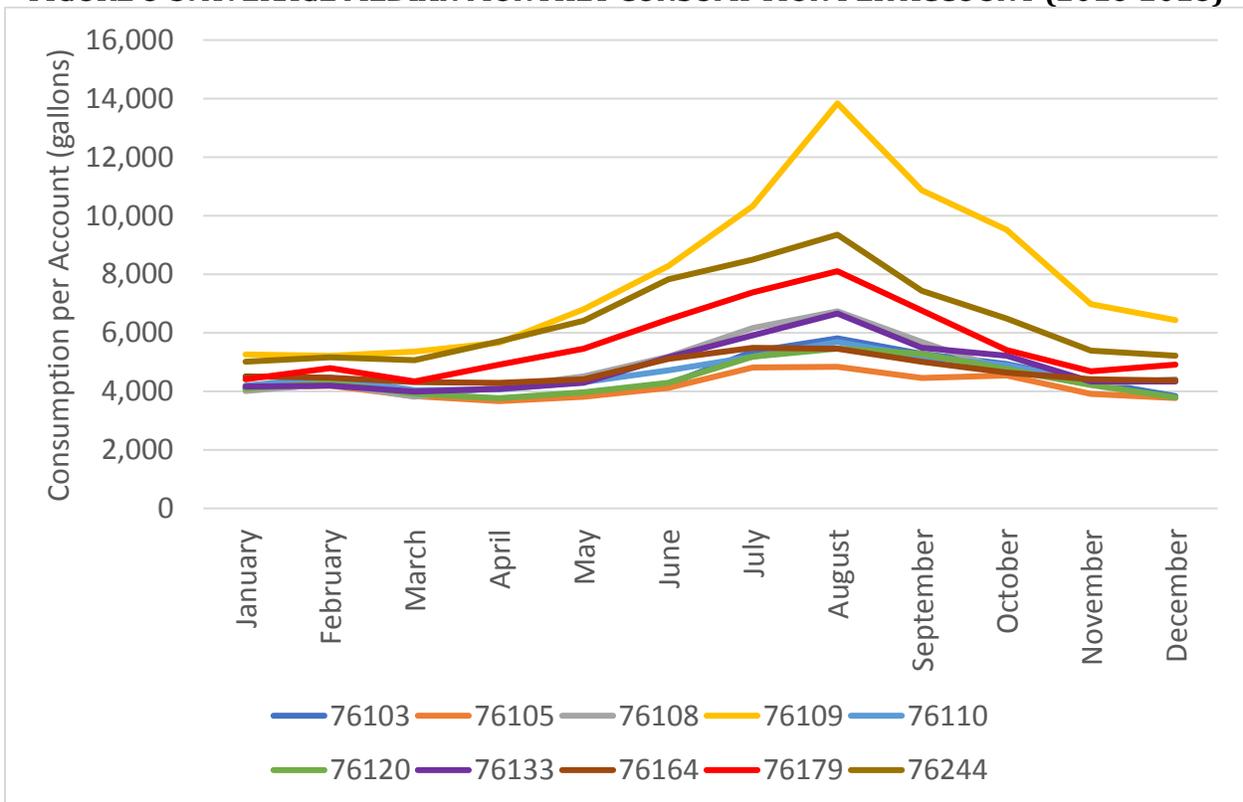


0 2.5  
 SCALE IN MILES

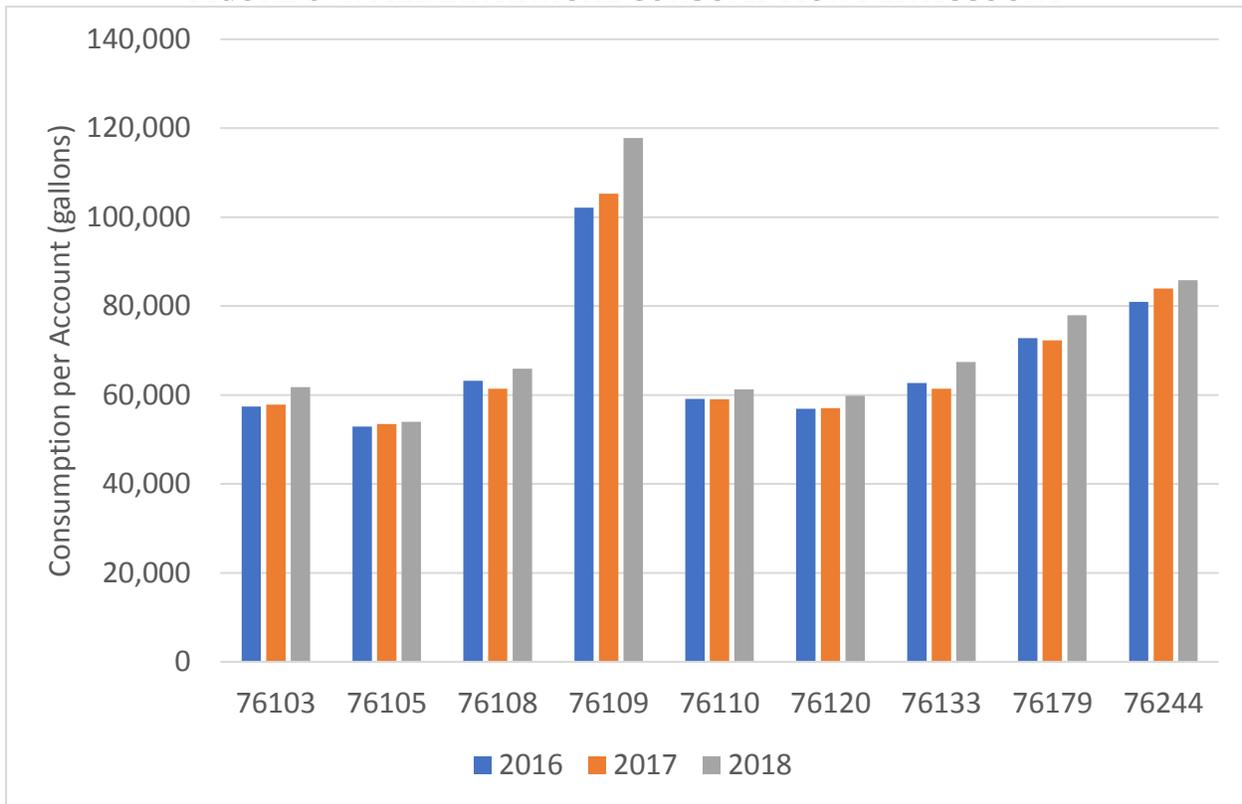
**FIGURE 8-2: RESIDENTIAL MEDIAN MONTHLY CONSUMPTION PER ACCOUNT**



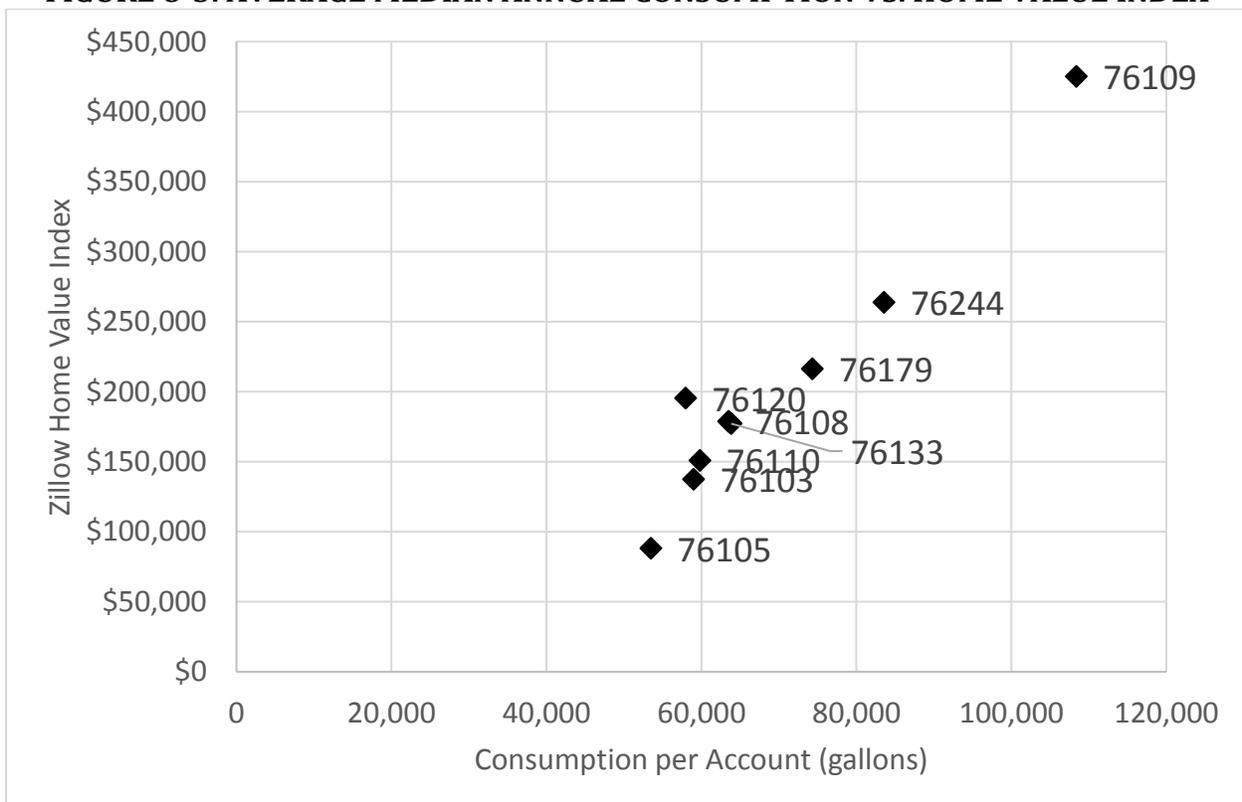
**FIGURE 8-3: AVERAGE MEDIAN MONTHLY CONSUMPTION PER ACCOUNT (2016-2018)**



**FIGURE 8-4: MEDIAN ANNUAL CONSUMPTION PER ACCOUNT**



**FIGURE 8-5: AVERAGE MEDIAN ANNUAL CONSUMPTION VS. HOME VALUE INDEX**



Embarking on a preliminary Customer Characterization analysis for the City of Fort Worth revealed a number of findings:

- 76109 demonstrates higher peak demand and annual usage than the sample of other zip codes.
- Home value is correlated with water usage.
- While water usage by accounts with 5/8" meters was relatively flat across zip codes, water usage by accounts with 1" and 1 ½" meters was significantly higher within 76109, and there is a much higher number of accounts with 1" and 1 ½" meters within 76109.
- 76109 demonstrated a significant increase in median annual consumption per account between 2016 and 2018, while 76244, 76103, 76133, and 76179 exhibited a moderate increase and the other zip codes showed a nominal increase.

These insights provide direction to Fort Worth staff about where to target BMPs focusing on reducing peak demand, based on the monthly usage patterns seen in 76109 and to some extent 76244 and 76179. Reducing annual demand could be achieved by both targeting programs on a geographic basis (increases in annual demand seen in 76109, 76244, 76103, 76133, and 76179), within subsets of a geographic area (significantly higher use among 1" and 1 ½" meters in 76109), as well as across its service area based on a specific attribute (home value). Findings such as these, will allow the City to target programs towards subsets of customers where the greatest potential savings may be achieved.

This is merely a preliminary step in the Customer Characterization process. City of Fort Worth may regularly update this characterization on an annual basis. Additionally, City of Fort Worth intends to perform Customer Characterization on its entire service area, to capture any opportunities outside of the ten zip codes evaluated in this preliminary analysis. Utilizing the MyH2O data this characterization can be conducted on a sub-monthly basis for certain subsets of the City.

## **8.2 LANDSCAPE ORDINANCES**

The City of Fort Worth is projected to have substantial population growth in the next fifty years. The additional population will require additional housing. Review of existing landscape ordinances may be conducted through an inter-departmental process with regular meetings between departments. The process may include:

- Review of the existing ordinances for alignment with the goals of this Plan.

- Benchmarking of the current landscape ordinance with ordinances from other cities promoting water conservation.
- Identification of drought tolerant turf, groundcover, shrubs and trees that are allowed to be planted at new homes.
- Integrating landscape ordinances and other outdoor conservation strategies into land use planning.
- Providing opportunity for feedback from interested parties and citizens.

The City intends to initiate the process of reviewing the existing landscape ordinances for potential to better align those ordinances with water conservation goals in the next five years.

### **8.3 LANDSCAPE AND IRRIGATION SYSTEM INCENTIVES**

The City of Fort Worth has proactively targeted programs towards indoor water use documented in this Water Conservation Plan through their ICI program and education measures. In an effort to address outdoor water use the City implemented their year-round twice per week watering schedule with the adoption of the 2014 Plan. City staff have identified outdoor water use reductions as the best opportunity to further reduce water consumption.

#### Landscape Replacement

Expenditures and water savings vary across utilities that utilize landscape replacement programs. Southern Nevada Water Authority has had a program since 1999 that has paid out more than \$200 million in rebates, removing roughly 185 million square feet. Between 2009-2015, Los Angeles area agencies paid out more than \$42 million, removing 15 million square feet. Approximately 1.5% of all single-family households in Los Angeles are participating, saving ~66,000 gallons per participating household per year.

### Irrigation System Incentives

Recent research has indicated a strong relationship between irrigation system capacity (total gallons per minute) and total water use. As irrigation system capacity increases, total water use tends to increase linearly. Based on this research programs or incentives that reduce the capacity of the irrigation system should be effective in reducing outdoor water use. Potential incentives include:

- Irrigation nozzle replacement – converting traditional spray nozzles to MP Rotators which have a lower gallon per minute distribution rate.
- Irrigation zone retrofits – changing irrigation zones from spray nozzles to drip irrigation with associated changes in landscaping from turf to landscaped beds.
- Removing irrigation zones – capping and removing a zone from the irrigation system since that area has been converted and no longer requires irrigation.
- Pressure Reducing Valves – these can be utilized for area with high pressure that cause misting and irrigation nozzles to operate outside of the specified pressure.

The City of Fort Worth intends to evaluate these types of landscape and irrigation system incentives in the next five years.

## **8.4 ADVANCED COMMUNITY ENGAGEMENT**

As the City of Fort Worth embarks on expanding the portfolio of conservation initiatives, community support will be essential. City staff intends to engage as many stakeholders as possible as early as possible to ensure success. Below is a list of potential new ways to stimulate conversation, although the City intends to continue running its current outreach programs, and consider other new engagement opportunities not listed below.

### Homebuilder/HOA Coordination

Cultivating positive relationships with homebuilders and HOAs will be essential to potential ordinance changes identified in Section 8.2. During the conceptualization and development of the potential ordinance changes, early collaboration with this industry will help craft regionally appropriate language, and foster buy-in within the regulated sector. Establishing these connections will not only break down silos, but will also streamline the process of enforcing and refining the regulations.

### Demonstration Gardens

City of Fort Worth, in partnership with Texas AgriLife Extension Service, hosts a series of monthly free seminars designed to educate the community on ways to reduce discretionary usage. These are held at the demonstration garden at the Botanical Research Institute. Future expansion of this program to additional neighborhoods and facilities will continue to further awareness within the community.

### Leverage Community Organizations

Utilities are increasingly recognizing that their Conservation staff cannot be in the community as often as needed. For this reason, the WCAC adopted the Partnerships with Nonprofit Organizations BMP, which recommends taking advantage of volunteer organizations with diverse memberships to bolster staff efforts. Contracts with County Master Gardeners, the Audubon Society, and many other organizations will help raise awareness within the community. These groups may be compensated for the amount of outreach they perform via “performance agreements” and are expected to deliver their results. They are paid a pre-approved amount that is modified according to event attendance. By activating knowledgeable members of the community, a utility can increase the number of customer interactions, reduce the unit cost of those interactions, and the partner organizations benefit from greater exposure with the community.

### Collaborate with Affordability Partners

Working with other agencies to take advantage of their existing systems to connect with low income residents can help magnify the number of customers enlisted. City staff can create pipelines with Councilmembers’ Offices, County officials, electric utility affordability programs, and others. Bolstering a strong affordability program will help minimize the impacts to customers from rate adjustments, and can provide a conservation benefit as well. Some affordability programs such as a plumbing assistance program will directly reduce water usage, while other affordability programs might be another avenue that City of Fort Worth uses to distribute conservation messaging.

## **8.5 IRRIGATION DESIGN CRITERIA**

As part of the requirement that all new irrigation systems be in compliance with state design and installation regulations (Texas Administrative Code Title 30, Chapter 344) the City of Fort Worth reviews irrigation design during development reviews. The reviews verify that the landscape design meets state and City standards. In the future, it is possible that the City may align their design criteria with best practices identified in Section 8.3. The City of Fort Worth may evaluate these design standards in an effort to align them with water conservation program goals in the next five years.

## **9.0 ADOPTION OF WATER CONSERVATION PLAN; PERIODIC REVIEW AND UPDATE OF PLAN**

Opportunity for public comment on the plan was provided at a City of Fort Worth City Council meeting on April 9, 2019. Appendix E contains a copy of the minutes of the April 9, 2019 City Council meeting at which this Water Conservation Plan was adopted.

TCEQ requires that water conservation plans be reviewed and, if necessary, updated every five years to coincide with the regional water planning process. This Water Conservation Plan will be updated as required by TCEQ and, in addition, will be continually reassessed for opportunities to improve water efficiency and conservation based on new or updated information.

**APPENDIX A**  
**LIST OF REFERENCES**

## APPENDIX A

### LIST OF REFERENCES

1. Title 30 of the Texas Administrative Code, Part 1, Chapter 288, Subchapter A, Rules 288.1 and 288.5, and Subchapter B, Rule 288.22, downloaded from [https://texreg.sos.state.tx.us/public/readtac\\$ext.ViewTAC?tac\\_view=4&ti=30&pt=1&ch=288](https://texreg.sos.state.tx.us/public/readtac$ext.ViewTAC?tac_view=4&ti=30&pt=1&ch=288), January 2019.
2. Tarrant Regional Water District, “Water Conservation and Drought Contingency Plan”, prepared by the Tarrant Regional Water District, April 2014.
3. Water Conservation Implementation Task Force: “Texas Water Development Board Report 362, Water Conservation Best Management Practices Guide,” prepared for the Texas Water Development Board, Austin, November 2004.
4. Water Conservation Advisory Council: Guidance and Methodology for Reporting on Water Conservation and Water Use, December 2012.
5. Texas Commission on Environmental Quality Implementation Report. <https://www.tceq.texas.gov/assets/public/permitting/forms/20645.pdf>.
6. City of Fort Worth Informal Report to City Council Members, January 15, 2019.
7. *Fort Worth Star-Telegram*. 2015. Fort Worth on track to replace old water meters with electronic system. By Sandra Baker, August 25. <https://www.star-telegram.com/news/local/community/fort-worth/article32398953.html> (accessed 2019).

**APPENDIX B**

**TEXAS COMMISSION OF ENVIRONMENTAL QUALITY RULES ON  
MUNICIPAL WATER CONSERVATION PLANS**

## APPENDIX B

### TEXAS COMMISSION OF ENVIRONMENTAL QUALITY RULES ON MUNICIPAL WATER CONSERVATION PLANS

<b><u>TITLE 30</u></b>	ENVIRONMENTAL QUALITY
<b><u>PART 1</u></b>	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
<b><u>CHAPTER 288</u></b>	WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS
<b><u>SUBCHAPTER A</u></b>	WATER CONSERVATION PLANS
<b><u>RULE §288.1</u></b>	<b>Definitions</b>

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The following words and terms, when used in this chapter, shall have the following meanings, unless the context clearly indicates otherwise.

(1) Agricultural or Agriculture--Any of the following activities:

(A) cultivating the soil to produce crops for human food, animal feed, or planting seed or for the production of fibers;

(B) the practice of floriculture, viticulture, silviculture, and horticulture, including the cultivation of plants in containers or non-soil media by a nursery grower;

(C) raising, feeding, or keeping animals for breeding purposes or for the production of food or fiber, leather, pelts, or other tangible products having a commercial value;

(D) raising or keeping equine animals;

(E) wildlife management; and

(F) planting cover crops, including cover crops cultivated for transplantation, or leaving land idle for the purpose of participating in any governmental program or normal crop or livestock rotation procedure.

(2) Agricultural use--Any use or activity involving agriculture, including irrigation.

(3) Best management practices--Voluntary efficiency measures that save a quantifiable amount of water, either directly or indirectly, and that can be implemented within a specific time frame.

(4) Conservation--Those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water, or increase the recycling and reuse of water so that a water supply is made available for future or alternative uses.

(5) Commercial use--The use of water by a place of business, such as a hotel, restaurant, or office building. This does not include multi-family residences or agricultural, industrial, or institutional users.



(6) Drought contingency plan--A strategy or combination of strategies for temporary supply and demand management responses to temporary and potentially recurring water supply shortages and other water supply emergencies. A drought contingency plan may be a separate document identified as such or may be contained within another water management document(s).

(7) Industrial use--The use of water in processes designed to convert materials of a lower order of value into forms having greater usability and commercial value, and the development of power by means other than hydroelectric, but does not include agricultural use.

(8) Institutional use--The use of water by an establishment dedicated to public service, such as a school, university, church, hospital, nursing home, prison, or government facility. All facilities dedicated to public service are considered institutional regardless of ownership.

(9) Irrigation--The agricultural use of water for the irrigation of crops, trees, and pastureland, including, but not limited to, golf courses and parks which do not receive water from a public water supplier.

(10) Irrigation water use efficiency--The percentage of that amount of irrigation water which is beneficially used by agriculture crops or other vegetation relative to the amount of water diverted from the source(s) of supply. Beneficial uses of water for irrigation purposes include, but are not limited to, evapotranspiration needs for vegetative maintenance and growth, salinity management, and leaching requirements associated with irrigation.

(11) Mining use--The use of water for mining processes including hydraulic use, drilling, washing sand and gravel, and oil field re-pressuring.

(12) Municipal use--The use of potable water provided by a public water supplier as well as the use of sewage effluent for residential, commercial, industrial, agricultural, institutional, and wholesale uses.

(13) Nursery grower--A person engaged in the practice of floriculture, viticulture, silviculture, and horticulture, including the cultivation of plants in containers or nonsoil media, who grows more than 50% of the products that the person either sells or leases, regardless of the variety sold, leased, or grown. For the purpose of this definition, grow means the actual cultivation or propagation of the product beyond the mere holding or maintaining of the item prior to sale or lease, and typically includes activities associated with the production or multiplying of stock such as the development of new plants from cuttings, grafts, plugs, or seedlings.

(14) Pollution--The alteration of the physical, thermal, chemical, or biological quality of, or the contamination of, any water in the state that renders the water harmful, detrimental, or injurious to humans, animal life, vegetation, or property, or to the public health, safety, or welfare, or impairs the usefulness or the public enjoyment of the water for any lawful or reasonable purpose.

(15) Public water supplier--An individual or entity that supplies water to the public for human consumption.

(16) Regional water planning group--A group established by the Texas Water Development Board to prepare a regional water plan under Texas Water Code, §16.053.

(17) Residential gallons per capita per day--The total gallons sold for residential use by a public water supplier divided by the residential population served and then divided by the number of days in the year.

(18) Residential use--The use of water that is billed to single and multi-family residences, which applies to indoor and outdoor uses.



(19) Retail public water supplier--An individual or entity that for compensation supplies water to the public for human consumption. The term does not include an individual or entity that supplies water to itself or its employees or tenants when that water is not resold to or used by others.

(20) Reuse--The authorized use for one or more beneficial purposes of use of water that remains unconsumed after the water is used for the original purpose of use and before that water is either disposed of or discharged or otherwise allowed to flow into a watercourse, lake, or other body of state-owned water.

(21) Total use--The volume of raw or potable water provided by a public water supplier to billed customer sectors or nonrevenue uses and the volume lost during conveyance, treatment, or transmission of that water.

(22) Total gallons per capita per day (GPCD)--The total amount of water diverted and/or pumped for potable use divided by the total permanent population divided by the days of the year. Diversion volumes of reuse as defined in this chapter shall be credited against total diversion volumes for the purposes of calculating GPCD for targets and goals.

(23) Water conservation coordinator--The person designated by a retail public water supplier that is responsible for implementing a water conservation plan.

(24) Water conservation plan--A strategy or combination of strategies for reducing the volume of water withdrawn from a water supply source, for reducing the loss or waste of water, for maintaining or improving the efficiency in the use of water, for increasing the recycling and reuse of water, and for preventing the pollution of water. A water conservation plan may be a separate document identified as such or may be contained within another water management document(s).

(25) Wholesale public water supplier--An individual or entity that for compensation supplies water to another for resale to the public for human consumption. The term does not include an individual or entity that supplies water to itself or its employees or tenants as an incident of that employee service or tenancy when that water is not resold to or used by others, or an individual or entity that conveys water to another individual or entity, but does not own the right to the water which is conveyed, whether or not for a delivery fee.

(26) Wholesale use--Water sold from one entity or public water supplier to other retail water purveyors for resale to individual customers.

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**Source Note:** The provisions of this §288.1 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective August 15, 2002, 27 TexReg 7146; amended to be effective October 7, 2004, 29 TexReg 9384; amended to be effective January 10, 2008, 33 TexReg 193; amended to be effective December 6, 2012, 37 TexReg 9515; amended to be effective August 16, 2018, 43 TexReg 5218



<b><u>TITLE 30</u></b>	ENVIRONMENTAL QUALITY
<b><u>PART 1</u></b>	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
<b><u>CHAPTER 288</u></b>	WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS
<b><u>SUBCHAPTER A</u></b>	WATER CONSERVATION PLANS
<b><u>RULE §288.2</u></b>	<b>Water Conservation Plans for Municipal Uses by Public Water Suppliers</b>

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(a) A water conservation plan for municipal water use by public water suppliers must provide information in response to the following. If the plan does not provide information for each requirement, the public water supplier shall include in the plan an explanation of why the requirement is not applicable.

(1) Minimum requirements. All water conservation plans for municipal uses by public water suppliers must include the following elements:

(A) a utility profile in accordance with the Texas Water Use Methodology, including, but not limited to, information regarding population and customer data, water use data (including total gallons per capita per day (GPCD) and residential GPCD), water supply system data, and wastewater system data;

(B) a record management system which allows for the classification of water sales and uses into the most detailed level of water use data currently available to it, including, if possible, the sectors listed in clauses (i) - (vi) of this subparagraph. Any new billing system purchased by a public water supplier must be capable of reporting detailed water use data as described in clauses (i) - (vi) of this subparagraph:

- (i) residential;
  - (I) single family;
  - (II) multi-family;
- (ii) commercial;
- (iii) institutional;
- (iv) industrial;
- (v) agricultural; and,
- (vi) wholesale.

(C) specific, quantified five-year and ten-year targets for water savings to include goals for water loss programs and goals for municipal use in total GPCD and residential GPCD. The goals established by a public water supplier under this subparagraph are not enforceable;

(D) metering device(s), within an accuracy of plus or minus 5.0% in order to measure and account for the amount of water diverted from the source of supply;

(E) a program for universal metering of both customer and public uses of water, for meter testing and repair, and for periodic meter replacement;



(F) measures to determine and control water loss (for example, periodic visual inspections along distribution lines; annual or monthly audit of the water system to determine illegal connections; abandoned services; etc.);

(G) a program of continuing public education and information regarding water conservation;

(H) a water rate structure which is not "promotional," i.e., a rate structure which is cost-based and which does not encourage the excessive use of water;

(I) a reservoir systems operations plan, if applicable, providing for the coordinated operation of reservoirs owned by the applicant within a common watershed or river basin in order to optimize available water supplies; and

(J) a means of implementation and enforcement which shall be evidenced by:

(i) a copy of the ordinance, resolution, or tariff indicating official adoption of the water conservation plan by the water supplier; and

(ii) a description of the authority by which the water supplier will implement and enforce the conservation plan; and

(K) documentation of coordination with the regional water planning groups for the service area of the public water supplier in order to ensure consistency with the appropriate approved regional water plans.

(2) Additional content requirements. Water conservation plans for municipal uses by public drinking water suppliers serving a current population of 5,000 or more and/or a projected population of 5,000 or more within the next ten years subsequent to the effective date of the plan must include the following elements:

(A) a program of leak detection, repair, and water loss accounting for the water transmission, delivery, and distribution system;

(B) a requirement in every wholesale water supply contract entered into or renewed after official adoption of the plan (by either ordinance, resolution, or tariff), and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements in this chapter. If the customer intends to resell the water, the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with the provisions of this chapter.

(3) Additional conservation strategies. Any combination of the following strategies shall be selected by the water supplier, in addition to the minimum requirements in paragraphs (1) and (2) of this subsection, if they are necessary to achieve the stated water conservation goals of the plan. The commission may require that any of the following strategies be implemented by the water supplier if the commission determines that the strategy is necessary to achieve the goals of the water conservation plan:

(A) conservation-oriented water rates and water rate structures such as uniform or increasing block rate schedules, and/or seasonal rates, but not flat rate or decreasing block rates;

(B) adoption of ordinances, plumbing codes, and/or rules requiring water-conserving plumbing fixtures to be installed in new structures and existing structures undergoing substantial modification or addition;

(C) a program for the replacement or retrofit of water-conserving plumbing fixtures in existing structures;

(D) reuse and/or recycling of wastewater and/or graywater;



(E) a program for pressure control and/or reduction in the distribution system and/or for customer connections;

(F) a program and/or ordinance(s) for landscape water management;

(G) a method for monitoring the effectiveness and efficiency of the water conservation plan; and

(H) any other water conservation practice, method, or technique which the water supplier shows to be appropriate for achieving the stated goal or goals of the water conservation plan.

(b) A water conservation plan prepared in accordance with 31 TAC §363.15 (relating to Required Water Conservation Plan) of the Texas Water Development Board and substantially meeting the requirements of this section and other applicable commission rules may be submitted to meet application requirements in accordance with a memorandum of understanding between the commission and the Texas Water Development Board.

(c) A public water supplier for municipal use shall review and update its water conservation plan, as appropriate, based on an assessment of previous five-year and ten-year targets and any other new or updated information. The public water supplier for municipal use shall review and update the next revision of its water conservation plan every five years to coincide with the regional water planning group.

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**Source Note:** The provisions of this §288.2 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective October 7, 2004, 29 TexReg 9384; amended to be effective December 6, 2012, 37 TexReg 9515



<b><u>TITLE 30</u></b>	ENVIRONMENTAL QUALITY
<b><u>PART 1</u></b>	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
<b><u>CHAPTER 288</u></b>	WATER CONSERVATION PLANS, DROUGHT CONTINGENCY PLANS, GUIDELINES AND REQUIREMENTS
<b><u>SUBCHAPTER A</u></b>	WATER CONSERVATION PLANS
<b><u>RULE §288.5</u></b>	<b>Water Conservation Plans for Wholesale Water Suppliers</b>

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A water conservation plan for a wholesale water supplier must provide information in response to each of the following paragraphs. If the plan does not provide information for each requirement, the wholesale water supplier shall include in the plan an explanation of why the requirement is not applicable.

(1) Minimum requirements. All water conservation plans for wholesale water suppliers must include the following elements:

(A) a description of the wholesaler's service area, including population and customer data, water use data, water supply system data, and wastewater data;

(B) specific, quantified five-year and ten-year targets for water savings including, where appropriate, target goals for municipal use in gallons per capita per day for the wholesaler's service area, maximum acceptable water loss, and the basis for the development of these goals. The goals established by wholesale water suppliers under this subparagraph are not enforceable;

(C) a description as to which practice(s) and/or device(s) will be utilized to measure and account for the amount of water diverted from the source(s) of supply;

(D) a monitoring and record management program for determining water deliveries, sales, and losses;

(E) a program of metering and leak detection and repair for the wholesaler's water storage, delivery, and distribution system;

(F) a requirement in every water supply contract entered into or renewed after official adoption of the water conservation plan, and including any contract extension, that each successive wholesale customer develop and implement a water conservation plan or water conservation measures using the applicable elements of this chapter. If the customer intends to resell the water, then the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with applicable provisions of this chapter;

(G) a reservoir systems operations plan, if applicable, providing for the coordinated operation of reservoirs owned by the applicant within a common watershed or river basin. The reservoir



systems operations plans shall include optimization of water supplies as one of the significant goals of the plan;

(H) a means for implementation and enforcement, which shall be evidenced by a copy of the ordinance, rule, resolution, or tariff, indicating official adoption of the water conservation plan by the water supplier; and a description of the authority by which the water supplier will implement and enforce the conservation plan; and

(I) documentation of coordination with the regional water planning groups for the service area of the wholesale water supplier in order to ensure consistency with the appropriate approved regional water plans.

(2) Additional conservation strategies. Any combination of the following strategies shall be selected by the water wholesaler, in addition to the minimum requirements of paragraph (1) of this section, if they are necessary in order to achieve the stated water conservation goals of the plan. The commission may require by commission order that any of the following strategies be implemented by the water supplier if the commission determines that the strategies are necessary in order for the conservation plan to be achieved:

(A) conservation-oriented water rates and water rate structures such as uniform or increasing block rate schedules, and/or seasonal rates, but not flat rate or decreasing block rates;

(B) a program to assist agricultural customers in the development of conservation pollution prevention and abatement plans;

(C) a program for reuse and/or recycling of wastewater and/or graywater; and

(D) any other water conservation practice, method, or technique which the wholesaler shows to be appropriate for achieving the stated goal or goals of the water conservation plan.

(3) Review and update requirements. The wholesale water supplier shall review and update its water conservation plan, as appropriate, based on an assessment of previous five-year and ten-year targets and any other new or updated information. A wholesale water supplier shall review and update the next revision of its water conservation plan every five years to coincide with the regional water planning group.

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**Source Note:** The provisions of this §288.5 adopted to be effective May 3, 1993, 18 TexReg 2558; amended to be effective February 21, 1999, 24 TexReg 949; amended to be effective April 27, 2000, 25 TexReg 3544; amended to be effective October 7, 2004, 29 TexReg 9384; amended to be effective December 6, 2012, 37 TexReg 9515

**APPENDIX C**

**CITY OF FORT WORTH UTILITY PROFILES BASED ON TCEQ FORMAT**



**Texas Commission on Environmental Quality**

**UTILITY PROFILE AND WATER CONSERVATION PLAN  
REQUIREMENTS FOR MUNICIPAL WATER USE  
BY RETAIL PUBLIC WATER SUPPLIERS**

This form is provided to assist retail public water suppliers in water conservation plan development. If you need assistance in completing this form or in developing your plan, please contact the conservation staff of the Resources Protection Team in the Water Availability Division at (512)239-4691.

**City of Fort Worth - Utility Profile Based on TCEQ Format**

Name: City of Fort Worth  
Address: 200 Texas St.  
Fort Worth, TX 76102  
Telephone Number: (817) 392-8740  
Water Right No.(s): 3340, 3366  
Regional Water Planning Group: Region C  
Form Completed by: Adam Conner  
Title: Freese and Nichols  
Person responsible for  
implementing conservation  
program: Micah Reed Phone: (817)392-8211  
Signature: *Micah S. Reed* Date: 4/22/2019

NOTE: If the plan does not provide information for each requirement, include an explanation of why the requirement is not applicable.

**UTILITY PROFILE**

**I. POPULATION AND CUSTOMER DATA**

**A. Population and Service Area Data**

1. Attach a copy of your service-area map, and if applicable, a copy of your Certificate of Convenience and Necessity (CCN).

See Figure 3-1

2. Service area size (square miles):                      371      Note: This represents retail service area only.

3. Current population of service area:                      815,430      Note: This represents retail population only.

4. Current population served for:

a. water:    815,430

b. wastewater:    808,907

5. Population served by utility for the previous five years:

*Note: This represents retail population only.*

6. Projected Population for service area in the following decades:

*Note: This represents retail population only.*

<u>Year</u>	<u>Population</u>
<u>2013</u>	<u>767,560</u>
<u>2014</u>	<u>781,100</u>
<u>2015</u>	<u>792,720</u>
<u>2016</u>	<u>806,380</u>
<u>2017</u>	<u>815,430</u>

<u>Year</u>	<u>Population</u>
<u>2020</u>	<u>960,824</u>
<u>2030</u>	<u>1,215,589</u>
<u>2040</u>	<u>1,499,216</u>
<u>2050</u>	<u>1,671,604</u>
<u>2060</u>	<u>1,819,451</u>

7. List source or method for the calculation of current and projected population size.

*Current Population based on Water Use Surveys (NCTCOG estimates); Projected Population is from draft 2021 Region C Plan.*

**B. Customers Data**

Senate Bill 181 requires that uniform consistent methodologies for calculating water use and conservation be developed and available to retail water providers and certain other water use sectors as a guide for preparation of water use reports, water conservation plans, and reports on water conservation efforts. A water system must provide the most detailed level of customer and water use data available to it, however, any new billing system purchased must be capable of reporting data for each of the sectors listed below.

[http://www.tceq.texas.gov/assets/public/permitting/watersupply/water\\_rights/sb181\\_guidance.pdf](http://www.tceq.texas.gov/assets/public/permitting/watersupply/water_rights/sb181_guidance.pdf)

1. Current number of active connections. Check whether multi-family service is counted as Residential  or Commercial?

*Note: This represents retail connection count in 2017*

<i>Treated Water Users</i>	<i>Metered</i>	<i>Non-Metered</i>	<b>Totals</b>
Residential Single Family	223,406		223,406
Commercial	13,531		13,531
Commercial Apartment	1,816		1,816
Industrial	328		328
Oil & Gas	6		6
Super User	1		1
Fireline	2,436		2,436
Yard Meter	5,433		5,433
<b>TOTAL</b>	<b>246,957</b>	<b>0</b>	<b>246,957</b>

2. List the number of new connections per year for most recent three years.

<i>Year</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>
<i>Treated Water Users</i>			
Residential Single Family	3,735	2,590	5,261
Commercial	31	17	173
Commercial Apartment	14	-2	73
Industrial	5	-10	4
Oil & Gas	-16	-4	-3
Super User	0	0	-1
Fireline	39	89	115
Yard Meter	89	170	242
<b>TOTAL</b>	<b>162</b>	<b>260</b>	<b>603</b>

3. List of annual water use for the five highest volume customers.

*Note: This represents highest retail customers in 2017*

<i>Customer</i>	<i>Use (1,000 gal/year)</i>	<i>Treated or Raw Water</i>
1. Miller Brewing Company	656,528	Treated
2. Alcon Laboratories	394,208	Treated
3. Fort Worth ISD	252,019	Treated
4. Lockheed Martin Tactical A/S	228,645	Treated
5. Texas Christian University	219,388	Treated

**II. WATER USE DATA FOR SERVICE AREA**

**A. Water Accounting Data**

1. List the amount of water use for the previous five years (in 1,000 gallons.)  
 Indicate whether this is  diverted or  treated water.

*NOTE: This is the total diverted water (System Input Volume) minus wholesale sales.*

<u>Year</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>
<i>Month</i>					
January	3,013,650	3,146,900	2,869,070	2,906,840	2,821,600
February	2,665,240	2,680,980	2,550,400	2,933,970	2,749,560
March	3,138,100	3,076,010	2,944,820	3,024,510	3,501,770
April	3,219,930	3,289,460	3,025,080	3,186,170	3,229,290
May	3,860,070	3,771,080	2,864,310	3,256,960	4,190,110
June	4,002,710	3,997,860	3,696,580	3,669,740	4,203,770
July	4,546,710	4,626,950	5,268,080	4,591,100	4,323,400
August	4,994,450	4,964,740	5,649,880	4,842,290	4,153,220
September	4,737,000	4,508,170	4,964,440	4,017,960	4,210,790
October	3,875,200	4,223,150	4,410,110	3,913,120	3,790,000
November	3,039,010	3,039,980	3,130,440	3,322,460	3,585,290
December	3,096,920	2,987,570	3,038,230	3,222,850	3,115,660
<b>Totals</b>	<b>44,188,990</b>	<b>44,312,850</b>	<b>44,411,440</b>	<b>42,887,970</b>	<b>43,874,460</b>

Describe how the above figures were determined (e.g, from a master meter located at the point of a diversion from the source, or located at a point where raw water enters the treatment plant, or from water sales).

*Use this space to include description of methods*

2. Amount of water (in 1,000 gallons) delivered/sold as recorded by the following account types for the past five years.

<u>Year</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>
<i>Account Types</i>					
Residential	18,240,660	17,827,770	17,658,150	17,061,400	17,831,660
<i>Single-Family</i>	18,240,660	17,827,770	17,658,150	17,061,400	17,831,660
<i>Multi-Family</i>	Categorized as Commercial				
Commercial	14,169,280	13,769,100	13,780,040	13,277,670	14,520,400
Industrial	6,190,830	3,268,830	3,174,560	3,136,230	3,202,540
<b>TOTAL</b>	<b>38,600,770</b>	<b>34,865,700</b>	<b>34,612,750</b>	<b>33,475,300</b>	<b>35,554,600</b>

3. List the previous records for water loss for the past five years (the difference between water diverted or treated and water delivered or sold).

*Note: Water loss is different from Non-Revenue Water, which includes Authorized Use*

<i>Year</i>	<i>Amount (gallons)</i>	<i>Percent</i>
2013	10,459,371,249	23.2%
2014	8,699,128,481	19.1%
2015	8,745,649,793	19.0%
2016	8,947,583,110	20.9%
2017	8,118,419,355	18.1%

**B. Projected Water Demands**

If applicable, attach or cite projected water supply demands from the applicable Regional Water Planning Group for the next ten years using information such as population trends, historical water use, and economic growth in the service area over the next ten years and any additional water supply requirements from such growth.

<b>Year</b>	<b>Projected Demand (AF/Y)</b>	<b>Source of data</b>
2017	144,575	Historical Demand
2018	159,420	<i>Interpolated</i>
2019	174,265	<i>Interpolated</i>
2020	189,110	2021 Region C Water Plan
2021	193,659	<i>Interpolated</i>
2022	198,207	<i>Interpolated</i>
2023	202,756	<i>Interpolated</i>
2024	207,305	<i>Interpolated</i>
2025	211,854	<i>Interpolated</i>
2026	216,402	<i>Interpolated</i>
2027	220,951	<i>Interpolated</i>

*Note: Projections are for retail customers only. Projections include TWDB estimated reductions for plumbing fixtures. Projections are from the draft 2021 Region C Plan as approved by TWDB, and include County-Other.*

**III. WATER SUPPLY SYSTEM DATA**

**A. Water Supply Sources**

List all current water supply sources and the amounts authorized (in acre feet) with each.

<i>Water Type</i>	<i>Source</i>	<i>Amount Authorized</i>
Surface Water		No set contract amount.
Groundwater		Tarrant Regional Water
Contracts	Tarrant Regional Water District	District will supply amount
Other		equal to demand.
<b>Total</b>		

**B. Treatment and Distribution System**

1. Design daily capacity of system:

Treatment Plant	Design Capacity (MGD)	Reliable Pumping Capacity (MGD)
North Holly	80	75
South Holly	100	95
Rolling Hills	200	190
Eagle Mountain	105	100
Westside	15	12
Total	500	472

2. Storage capacity:

- a. Elevated 19 MG
- b. Ground 76.67 MG

3. If surface water, do you recycle filter backwash to the head of the plant?  
 Yes     No    If yes, approximate amount (MGD): 3.7

*Note: This represents filter backwash and other processes in 2017*

**IV. WASTEWATER SYSTEM DATA**

**A. Wastewater System Data (if applicable)**

1. Design capacity of wastewater treatment plant(s) (MGD): 166.0

2. Treated effluent is used for:
- on-site irrigation,
  - off-site irrigation,
  - plant wash-down, and or
  - chlorination/dechlorination.

If yes, approximate amount (in gallons per month): 270 million gallons per month

*Note: Wholesale, retail, and plant service reclaimed consumption in 2017*

3. Briefly describe the wastewater system(s) of the area serviced by the water utility. Describe how treated wastewater is disposed. Where applicable, identify treatment plant(s) with the TCEQ name and number, the operator, owner, and the receiving stream if wastewater is discharged.

Treatment Plant Name	TCEQ Number	Permitted Discharge (MGD)	Operator	Owner	Receiving Stream
Village Creek Water Reclamation Facility	TX0047295	166.0	Fort Worth	Fort Worth	Village Creek and the West Fork of the Trinity River

**B. Wastewater Data for Service Area (if applicable)**

1. Percent of water service area served by wastewater system: 99%

2. Monthly volume treated for previous five years (in 1,000 gallons):

*Note: This represents retail and wholesale wastewater.*

<i>Year</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>
<i>Month</i>					
January	3,814,600	3,340,900	3,472,530	4,633,498	3,460,000
February	3,119,460	2,875,220	3,267,520	3,793,886	3,181,000
March	3,398,680	3,116,190	4,461,210	5,003,285	3,166,000
April	3,675,750	3,220,200	4,382,090	5,049,017	3,539,000
May	3,409,420	3,372,060	6,995,210	4,615,775	3,387,000
June	3,486,790	3,482,030	5,103,020	4,840,336	3,813,000
July	3,457,360	3,347,880	3,572,640	3,603,841	3,700,000
August	3,463,100	3,204,580	3,213,860	3,505,483	3,477,000
September	3,255,870	3,136,980	3,068,820	3,323,119	3,227,000
October	3,373,820	3,131,310	3,810,184	3,361,000	3,229,019
November	3,252,580	3,167,980	4,733,546	3,306,000	3,027,585
December	3,739,050	3,043,480	5,535,755	3,158,000	3,289,857
<b>Totals</b>	<b>41,446,480</b>	<b>38,438,810</b>	<b>51,616,385</b>	<b>48,193,239</b>	<b>40,496,461</b>

	<p><b>Texas Commission on Environmental Quality</b></p> <p><b>UTILITY PROFILE AND WATER CONSERVATION PLAN</b>  <b>REQUIREMENTS FOR WHOLESAL PUBLIC</b>  <b>WATER SUPPLIERS</b></p>
<p>This form is provided to assist wholesale public water suppliers in water conservation plan development. Information from this form should be included within a wholesale public water supplier water conservation plan. If you need assistance in completing this form or in developing your plan, please contact the conservation staff of the Resources Protection Team in the Water Supply Division at (512)239-4691.</p>	

Name of Entity:	City of Fort Worth	
Address:	200 Texas St.	
	Fort Worth, TX 76102	
Telephone Number:	(817) 392-8740	
Water Right No.(s):	3340, 3366	
Regional Water Planning Group:	Region C	
Form Completed by:	Adam Conner	
Title:	Freese and Nichols	
Person responsible for implementing conservation program:	Micah Reed	Phone: (817)392-8211
Signature:		Date: 4/22/2019

NOTE: If the plan does not provide information for each requirement, include an explanation of why the requirement is not applicable.

**UTILITY PROFILE**

**I. WHOLESAL SERVICE AREA POPULATION AND CUSTOMER DATA**

**A. Population and Service Area Data**

1. Attach a copy of your service-area map, and if applicable, a copy of your Certificate of Convenience and Necessity (CCN).

See Figure 3-1

2. Service area size (square miles): 307 *Note: This represents wholesale service area only.*

3. Current population of service area: 439,342 *Note: This represents wholesale population only.*

4. Current population served for:

a. water: 439,342

b. wastewater: 435,827

5. Population served by utility for the previous five years:

*Note: This represents wholesale population only.*

<u>Year</u>	<u>Population</u>
<u>2013</u>	<u>381,350</u>
<u>2014</u>	<u>387,961</u>
<u>2015</u>	<u>393,019</u>
<u>2016</u>	<u>401,190</u>
<u>2017</u>	<u>439,342</u>

6. Projected Population for service area in the following decades:

*Note: This represents wholesale population only.*

<u>Year</u>	<u>Population</u>
<u>2020</u>	<u>433,767</u>
<u>2030</u>	<u>479,226</u>
<u>2040</u>	<u>518,314</u>
<u>2050</u>	<u>590,531</u>
<u>2060</u>	<u>658,639</u>

7. List source or method for the calculation of current and projected population size.

*These are only wholesale customers. For projections, draft 2021 Region C Plan projections for estimates of percent of population to be served by Fort Worth was used. Projections include County-Other, whereas historic does not.*

**B. Customers Data**

List (or attach) the names of all wholesale customer, amount of annual contract, and amount **sold** for each for the previous year:

	Wholesale Customer	Contracted Amount (acre-feet)	Previous Year Amount of Water Sold (acre-feet in CY17)
(1)	Aledo	N/A	382
(2)	Benbrook	N/A	0
(3)	Bethesda	N/A	3,108
(4)	Burleson	N/A	5,150
(5)	Crowley	N/A	2,032
(6)	D/FW Regional Airport	N/A	1,012
(7)	Dalworthington	N/A	305
(8)	Everman	N/A	0
(9)	Forest Hill	N/A	1,210
(10)	Grand Prairie	N/A	2,117
(11)	Haltom City	N/A	4,892
(12)	Haslet	N/A	590
(13)	Hurst	N/A	5,811
(14)	Keller	N/A	9,077
(15)	Kennedale	N/A	193
(16)	Lake Worth	N/A	625
(17)	North Richland Hills	N/A	6,529
(18)	Northlake	N/A	317
(19)	Ridglea Country Club	N/A	10
(20)	River Oaks	N/A	14
(21)	Roanoke	N/A	1,739
(22)	Saginaw	N/A	3,155
(23)	Sansom Park	N/A	0
(24)	Southlake	N/A	9,992
(25)	TRA	N/A	0
(26)	Trophy Club MUD #1	N/A	2,347
(27)	Westlake	N/A	1,382
(28)	White Settlement	N/A	1,495
(29)	Edgecliff Village	N/A	475
(30)	Westover Hills	N/A	598
(31)	Westworth Village	N/A	342
			<b>64,897</b>

**II. WATER USE DATA FOR SERVICE AREA**

**A. Water Delivery**

Indicate if the water provided under wholesale contracts is treated or raw water, and the annual amount for each for the previous year:

Total amount delivered or **sold** for previous year (acre-feet in 2017)

Treated: 65,742.1 (sold treated)

Raw: 0 (sold raw)

**B. Water Accounting Data**

1. Total amount of water **sold** for previous five years (in acre-feet) to all wholesale customers:

*Note: This represents wholesale sales, not diversions.*

Year	2013	2014	2015	2016	2017
January	3,441.6	3,485.3	3,727.5	3,891.2	3,814.6
February	3,329.3	3,549.2	3,295.4	3,929.2	3,620.2
March	4,501.1	4,685.3	3,558.9	3,848.4	4,506.8
April	4,565.8	4,896.5	3,823.3	4,481.9	5,103.6
May	5,536.4	6,432.5	3,804.8	4,128.4	6,620.8
June	7,304.9	5,906.2	5,514.5	5,565.6	5,640.4
July	8,243.0	7,275.9	7,606.9	8,127.0	7,522.8
August	9,649.0	8,774.8	10,583.1	7,399.7	6,082.8
September	7,208.5	7,141.4	8,195.3	6,396.3	7,676.6
October	5,380.7	6,084.8	6,874.3	6,142.3	5,926.3
November	4,467.3	4,645.1	3,758.0	4,297.8	4,789.6
December	3,713.0	3,777.3	3,448.7	3,342.5	4,437.7
<b>TOTAL</b>	<b>67,340.7</b>	<b>66,654.2</b>	<b>64,190.9</b>	<b>61,550.3</b>	<b>65,742.1</b>

Describe how the above figures were determined (e.g, from a master meter located at the point of a diversion from the source, or located at a point where raw water enters the treatment plant, or from water sales).

*Wholesale water sales are recorded at meters at multiple delivery points.*

2. Wholesale population served and total amount of water **sold** for **municipal use** for previous five years:

*Note: It is estimated that 95% of all wholesale water sales is for Municipal Use. These volumes represent 95% of volumes reported in Question II.B.1. above.*

Year	Total Population Served	Total Annual Water Sold for Municipal Use (acre-feet)
2013	381,350	63,974
2014	387,961	63,322
2015	393,019	60,981
2016	401,190	58,473
2017	439,342	62,455

**C. Projected Water Demands**

If applicable, attach or cite projected water supply demands from the applicable Regional Water Planning Group for the next ten years using information such as population trends, historical water use, and economic growth in the service area over the next ten years and any additional water supply requirements from such growth.

<b>Year</b>	<b>Projected Demand (AF/Y)</b>	<b>Source of data</b>
2017	65,742	Water Use Report
2018	72,485	<i>Interpolated</i>
2019	79,227	<i>Interpolated</i>
2020	85,970	Draft 2021 Region C Plan
2021	87,011	<i>Interpolated</i>
2022	88,052	<i>Interpolated</i>
2023	89,093	<i>Interpolated</i>
2024	90,134	<i>Interpolated</i>
2025	91,176	<i>Interpolated</i>
2026	92,217	<i>Interpolated</i>
2027	93,258	<i>Interpolated</i>

*Note: Projections are for wholesale customers only. Projections include TWDB estimated reductions for plumbing fixtures. Projections are from the draft 2021 Region C Plan as approved by TWDB, and include County-Other.*

**III. WATER SUPPLY SYSTEM DATA**

**A. Water Supply Sources**

List all current water supply sources and the amounts authorized (in acre feet) with each.

<i>Water Type</i>	<i>Source</i>	<i>Amount Authorized</i>
Surface Water		
Groundwater		
Contracts	City of Fort Worth	No set contract amount. Fort Worth will supply amount equal to demand.
Other		
<b>Total</b>		

**B. Treatment and Distribution System (if provide treated water)**

1. Design daily capacity of system:

Treatment Plant	Design Capacity (MGD)	Reliable Pumping Capacity (MGD)
North Holly	80	75
South Holly	100	95
Rolling Hills	200	190
Eagle Mountain	105	100
Westside	15	12
Total	500	472

2. Storage capacity:

- a. Elevated 19 MG
- b. Ground 76.67 MG

3. Please describe the water system and attach. Include the number of treatment plants, wells, and storage tanks. If possible, attach a sketch of the system layout.

4. If surface water, do you recycle filter backwash to the head of the plant?

- Yes  No If yes, approximate amount (MGD): 3.7

*Note: This represents filter backwash and other processes in 2017*

**IV. WASTEWATER SYSTEM DATA**

**A. Wastewater System Data (if applicable)**

1. Design capacity of wastewater treatment plant(s) (MGD): 166.0

2. Briefly describe the wastewater system(s) of the area serviced by the wholesale public water supplier. Describe how treated wastewater is disposed of. Where applicable, identify treatment plant(s) with the TCEQ name and number, the operator, owner, and the receiving stream if wastewater is discharged. If possible, attach a sketch or map which locates the plant(s) and discharge points or disposal sites.

Treatment Plant Name	TCEQ Number	Permitted Discharge (MGD)	Operator	Owner	Receiving Stream
Village Creek Water	TX0047295	166.0	Fort Worth	Fort Worth	Village Creek and the West Fork

**B. Wastewater Data for Service Area (if applicable)**

1. Percent of water service area served by wastewater system: 99%

2. Monthly volume treated for previous five years (in 1,000 gallons):

*Note: This represents retail and wholesale wastewater.*

Year	2013	2014	2015	2016	2017
<b>January</b>	3,814,600	3,340,900	3,472,530	4,633,498	3,460,000
<b>February</b>	3,119,460	2,875,220	3,267,520	3,793,886	3,181,000
<b>March</b>	3,398,680	3,116,190	4,461,210	5,003,285	3,166,000
<b>April</b>	3,675,750	3,220,200	4,382,090	5,049,017	3,539,000
<b>May</b>	3,409,420	3,372,060	6,995,210	4,615,775	3,387,000
<b>June</b>	3,486,790	3,482,030	5,103,020	4,840,336	3,813,000
<b>July</b>	3,457,360	3,347,880	3,572,640	3,603,841	3,700,000
<b>August</b>	3,463,100	3,204,580	3,213,860	3,505,483	3,477,000
<b>September</b>	3,255,870	3,136,980	3,068,820	3,323,119	3,227,000
<b>October</b>	3,373,820	3,131,310	3,810,184	3,361,000	3,229,019
<b>November</b>	3,252,580	3,167,980	4,733,546	3,306,000	3,027,585
<b>December</b>	3,739,050	3,043,480	5,535,755	3,158,000	3,289,857
<b>TOTAL</b>	<b>41,446,480</b>	<b>38,438,810</b>	<b>51,616,385</b>	<b>48,193,239</b>	<b>40,496,461</b>

**APPENDIX D**

**LETTERS TO REGION C AND REGION G WATER PLANNING GROUPS, AND  
TARRANT REGIONAL WATER DISTRICT**



April 22, 2019

Mr. Kevin Ward, Chair  
Region C Water Planning Group  
c/o Trinity River Authority  
P.O. Box 60  
Arlington, TX 76004

Dear Mr. Ward,

Enclosed please find a copy of the recently updated Water Conservation Plan for the City of Fort Worth. I am submitting a copy of this plan to the Region C Water Planning Group in accordance with the Texas Water Development Board and Texas Commission on Environmental Quality rules. The City of Fort Worth adopted the plan on April 9, 2019.

Sincerely,

Micah Reed  
City of Fort Worth

**WATER DEPARTMENT**  
**WATER CONSERVATION**



April 22, 2019

Mr. Wayne Wilson  
Chair, Region G Water Planning Group  
P.O. Box 7555  
Waco, TX 76714

Dear Mr. Wilson,

Enclosed please find a copy of the recently updated Water Conservation Plan for the City of Fort Worth. I am submitting a copy of this plan to the Region G Water Planning Group based on our wholesale customer Burleson which is located in Region G in accordance with the Texas Water Development Board and Texas Commission on Environmental Quality rules. The City of Fort Worth adopted the plan on April 9, 2019.

Sincerely,

Micah Reed  
City of Fort Worth

**WATER DEPARTMENT**  
**WATER CONSERVATION**



April 22, 2019

Mr. Jim Oliver, General Manager  
Tarrant Regional Water District  
800 East Northside Drive  
Fort Worth, TX 76102

Dear Mr. Oliver,

Enclosed please find a copy of the recently updated Water Conservation Plan for the City of Fort Worth. I am submitting a copy of this plan to the Region C Water Planning Group in accordance with the Texas Water Development Board and Texas Commission on Environmental Quality rules. The City of Fort Worth adopted the plan on April 9, 2019

Sincerely,

Micah Reed  
City of Fort Worth

**WATER DEPARTMENT**  
**WATER CONSERVATION**

**APPENDIX E**  
**ADOPTION OF WATER CONSERVATION PLAN**

# A Resolution

NO. 5076-04-2019

## ADOPTING THE 2019 WATER CONSERVATION PLAN

**WHEREAS**, the City Council finds that conservation of water and protection of water supplies are in the best interests of its citizens; and

**WHEREAS**, on April 8, 2014, the City Council adopted a water conservation plan by approving Resolution No. 4310-04-2014; and

**WHEREAS**, House Bill (HB) 2660 adopted by the 78<sup>th</sup> Texas Legislation and rules adopted by the Texas Commission on Environmental Quality pursuant to HB 2660 require that, beginning May 1, 2005, water conservation plans for municipal use by public water suppliers must include specific, quantified five-year and ten-year targets for water savings including goals for water loss programs and goals for municipal use in gallons per capita per day, and requires that plans must be reviewed and updated every five years; and

**WHEREAS**, the water conservation plan attached hereto as Exhibit "A" proposes a goal of water usage of 140 gallons per capita per day by 2024 and 136 gallons per capita by 2029; and

**WHEREAS**, it is the intent of the City Council that the water conservation plan attached hereto as Exhibit "A" supersede the water conservation plan approved by the City Council on April 8, 2014.

**NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF FORT WORTH, TEXAS, THAT:**

The City Council adopts the Water Conservation Plan attached hereto as Exhibit "A" as official City policy.

Adopted this 9<sup>th</sup> day of April, 2019.

ATTEST:

By:

  
Mary Kayser, City Secretary

